SEP 4 1940

THE JOURNAL OF POLITICAL ECONOMY

JOURNAL KUC
GENERAL LIBRA
UNIV. OF MIC

Volume XLVIII AUGUST 1940 Number 4

Elements of a Theory of Inventory — *E. S. Shaw* — 465

Adam Smith's Empiricism and the Law of Nature. I — *Henry J. Bittermann* — 487

Notes on the Theory of Duopoly — *George J. Stigler* — 521

The Institutional Man — *Harvey Pinney* — 543

Hicks and the Time-Period Controversy — *William Fellner and Howard S. Ellis* — 563

Flexibility of Cheese Prices — *Jules Backman* — 579

Extensive Expansion and Population Growth — *Alvin H. Hansen* — 583

Book Reviews — 586
(See inside front cover)

Books Received — 618

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO, ILLINOIS, U.S.A.

August 1940 Volume XLVIII, No. 4

THE JOURNAL OF POLITICAL ECONOMY

EDITED BY JACOB VINER AND F. H. KNIGHT, WITH THE CO-OPERATION OF THE OTHER MEMBERS OF THE DEPARTMENT OF ECONOMICS OF THE UNIVERSITY OF CHICAGO

BOOK REVIEWS:

Dorothy Fosdick, *What Is Liberty?* - - - - - - - - - - FRANK H. KNIGHT 581
Carl Snyder, *Capitalism, the Creator: The Economic Foundations of Modern Industrial Society* F. E. RICHTER 589
Erich Roll, *A History of Economic Thought* - - - - - - - - JOHN M. FERGUSON 591
Børge Barfod, *Local Economic Effects of a Large-Scale Industrial Undertaking* EDGAR M. HOOVER, JR. 595
Arthur Nussbaum, *Money in the Law* - - - - - - - - - - BERNARD BERNSTEIN 597
Leonard L. Watkins, *Commercial Banking Reform in the United States: With Especial Reference to the 100 Per Cent Plan and the Regulation of Interest Rates on Bank Deposits* - MELCHIOR PALYI 597
Erling Petersen, *Macro-dynamic Aspects of the Equation of Exchange* - - JOHN K. LANGUM 599
James W. Gantenbein, *Financial Questions in United States Foreign Policy* PERCY W. BIDWELL 600
Edwin Walter Kemmerer, *The A B C of the Federal Reserve System: Why the Federal Reserve System Was Called into Being, the Main Features of Its Organization, and How It Works* (11th rev. ed.) LLOYD W. MINTS 600
Archibald M. Woodruff, Jr., *Farm Mortgage Loans of Life Insurance Companies* ALBERT GAILORD HART 602
Joseph S. Davis, *On Agricultural Policy, 1926–1938* - - - - - - - JOHN D. BLACK 605
O. E. Baker, Ralph Borsodi, and M. L. Wilson, *Agriculture in Modern Life* - ALVIN E. COONS 605
Harold M. Groves, *Financing Government* - - - - - - - - - TIPTON R. SNAVELY 608
Fletcher Harper Swift, *The Financing of Institutions of Public Instruction in Germany, 1927–1937* JOHN DALE RUSSELL 610
Chester I. Barnard, *The Functions of the Executive* - - - - - - - CHARLES S. ASCHER 612
C. J. Friedrich and Edward S. Mason (eds.), *Public Policy: A Yearbook of the Graduate School of Public Administration, Harvard University, 1940* - - - - - - - EDWIN E. WITTE 614
Andrew W. Lind, *An Island Community: Ecological Succession in Hawaii* - - E. F. PENROSE 616
Richard A. Lester and Charles V. Kidd, *The Case against Experience Rating in Unemployment Compensation* - - - - - - - - - - - - - - - - - - CHARLES A. MYERS 617

The Journal of Political Economy is published bi-monthly, by the University of Chicago at the University of Chicago Press, 5750 Ellis Avenue, Chicago, Illinois. The subscription price is $5.00 per year; the price of single copies is $1.00. Orders for service of less than a full year will be charged at the single-copy rate. ¶ Postage is prepaid by the publishers on all orders from the United States, Mexico, Cuba, Puerto Rico, Panama Canal Zone, Republic of Panama, Dominican Republic, Canary Islands, El Salvador, Argentina, Bolivia, Brazil, Colombia, Chile, Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua, Peru, Hayti, Uruguay, Paraguay, Hawaiian Islands, Philippine Islands, Guam, Samoan Islands, Balearic Islands, Spain, and Venezuela. ¶ Postage is charged extra as follows: for Canada and Newfoundland, 25 cents on annual subscriptions (total $5.25); on single copies 4 cents (total $1.04); for all other countries in the Postal Union, 55 cents on annual subscriptions (total $5.55); on single copies 9 cents (total $1.09). ¶ Patrons are requested to make all remittances payable to the University of Chicago Press in postal or express money orders or bank drafts.

The following are authorized agents:

For the British Empire, except North America, India, and Australasia: The Cambridge University Press, Bentley House, 200 Euston Road, London, N.W. 1, England. Prices of yearly subscriptions and of single copies may be had on application.

For Japan: The Maruzen Company, Limited, Tokyo.

For China: The Commercial Press, Ltd., 211 Honan Road, Shanghai. Yearly subscriptions, $5.00; single copies, $1.00, or their equivalents in Chinese money. Postage extra, on yearly subscriptions 55 cents, on single copies 9 cents.

Claims for missing numbers should be made within the month following the regular month of publication. The publishers expect to supply missing numbers free only when losses have been sustained in transit and when the reserve stock will permit.

Business correspondence should be addressed to The University of Chicago Press, Chicago, Ill.

Communications for the editors and manuscripts should be addressed to the Editors of THE JOURNAL OF POLITICAL ECONOMY, The University of Chicago, Chicago, Ill.

The articles in this journal are indexed in the *Reader's Guide to Periodical Literature*, New York, New York.

Applications for permission to quote from this journal should be addressed to The University of Chicago Press, and will be freely granted.

Entered as second-class matter January 16, 1893, at the post-office at Chicago, Illinois, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized on July 13, 1918.

[PRINTED IN U.S.A.]

THE JOURNAL OF
POLITICAL ECONOMY

Volume XLVIII AUGUST 1940 *Number 4*

ELEMENTS OF A THEORY OF INVENTORY

E. S. SHAW
Stanford University

I

RECENT developments in price theory, cycle theory, and monetary management have demonstrated the need for a re-examination of the problem of inventory accumulation. Professor Hicks's survey of the dynamic pricing mechanism, for example, analyzes intertemporal substitutions between outputs of the single firm.[1] Though Professor Hicks himself does not trace through the implications for inventory, it is apparent that the option of reserving output from "present" markets is essential to elastic intertemporal adjustments. In cycle theory Mr. Hawtrey holds to his position that the response of inventories to changes in money rates of interest is the principal clue to fluctuations in the national income.[2] Efforts to discount his arguments by empirical proofs have not been entirely successful.[3] A recast-

[1] J. R. Hicks, *Value and Capital* (Oxford, 1939), chap. xv. In his *An Approach to a Price Theory for a Changing Economy* (New York, 1939) Mr. Moses Abramovitz makes the theory of inventory an integral element in his analysis of prices. For a brief discussion of his work see below, n. 26.

[2] R. G. Hawtrey, *A Century of Bank Rate* (London, 1938), chaps. vi and ix.

[3] See, e.g., the *Oxford Economic Papers*, No. 1 (October, 1938): H. D. Henderson, "The Significance of the Rate of Interest," pp. 1–13, and J. E. Meade and P. W. S. Andrews, "Summary of Replies to Questions on Effects of Interest Rates," pp. 14–31.

ing of inventory theory may at least clarify the issues which divide Mr. Hawtrey and his critics. Finally, control agencies lately have expressed fears of "speculative" inventories.[4] They imply that there is some appropriate level of inventories which is exceeded at the risk of excessively rapid economic expansion. No way of determining an "appropriate" level has been specified, with the result that it is impossible even for the authorities themselves to know how well founded their fears may be.

The purpose of this article is to examine deductively the motives which may induce a single firm to produce for stock rather than for immediate sale, as well as to retain goods already completed. There is no pretense to a final solution of the inventory problem as a whole. The analysis will not be generalized to fit a model of the entire pricing system; the case of raw- or process-material stocks will be ignored; it will be assumed that the function of holding stocks is not performed by specialists; and no empirical tests will be attempted. We are attempting a fresh start, confining ourselves strictly to fundamentals.

The first step must be a description of a technique which appears to be capable of isolating each determinant of stock accumulation by the firm. When this is completed, certain broad implications of the technique for the methodology of price analysis will be considered. The final pages will be devoted to certain aspects of the problem that relate to credit control and cycle theory.

II

The single firm is assumed to be producing a final good in an established plant. Its processes of manufacture are completed within some brief interval, a "week," and the output is available for sale in the same week.[5] Decisions regarding output and sales are made by the management on Monday of each week and are not subject to change until the succeeding Monday. The man-

[4] Board of Governors of the Federal Reserve System, *Twenty-fourth Annual Report* (1937), pp. 2, 8, and 10.

[5] The introduction of a lag between output and sales requires no significant modification of the results to which the analysis leads, while it does rather seriously complicate the geometric demonstrations.

agement bases its decisions on forecasts which extend over an expectation interval of two weeks. The demand and cost functions for the week including the planning date are assumed to be certain. The functions of the second week in the interval are not precisely known: they are simply the most probable functions, and any commitment of resources in anticipation of their being realized invites more or less serious loss. It is necessary to discount them, not only for interest but for risk as well. Functions of still later periods simply do not enter the calculations: there is no central tendency of managerial expectations to provide a reasonable basis for forecast. No explicit provision is made for them in the operating plans which are drawn up on any Monday.

The first problem to be examined is the firm's plan for Monday of week 1, when no stocks of finished goods are on hand. The plan must specify outputs and sales for weeks 1 and 2 (O_{1-2}, S_{1-2}). While the definition of the expectation interval requires that $O_{1-2} = S_{1-2}$, O_1 may exceed S_1 and O_2 may fall short of S_2 by equal amounts. That is to say, the plan may include an "anticipatory" decision to retain some portion of O_1 in inventory (I) for subsequent sale.

The plan for Monday of week 2 will also be studied. At this later date there is opportunity to reconsider the anticipatory decision to liquidate inventory in week 2. Of course, the prior decision to produce O_1 in excess of S_1 cannot be undone; but, since the expectation interval has been stepped one week forward into the future, inventory may be reserved an additional week: the anticipatory decision may be corrected by a "market" decision. In terms of traditional price theory, Monday of week 2 is a day for reaching market judgments that minimize the costs of previous inaccurate or restricted forecasts. But Monday of week 2 is also the occasion for reviewing earlier decisions regarding O_2 and its disposition and for taking first account of the probable size of O_3. When the new plan is complete, the management will have committed itself to O_2 and S_2, as well as to a specific I, and will have settled tentatively on the proportions of O_3 and S_3.

There are four features of this analytic model to which particular attention is called. The first is the diversity of demand and

cost functions which are admitted to entrepreneurial calculations as of any one planning date. The second is the emphasis upon the uncertainty of forecast: limits are imposed upon the expectation interval which can, of course, be extended or narrowed according to the degree of entrepreneurial confidence in the future; allowance is made for risk whenever resources are spent or revenues are foregone on the strength of estimates for the second week of the interval; functions forecast for the second week of a given interval are permitted to assume different values in the plans of the successive Mondays in the interval. The third feature is the recognition of continuity in planning from week to week, and the fourth is the integration of the inventory problem with the problems of output and sale in the complete short-period plan.

These four features establish the dynamic character of the analytic method to be employed below and set it apart from the methods of static economics. They constitute the minimum concession one can make to the instabilities as well as to the continuities of economic reality. Further discussion of their general methodological significance is reserved until the principles of inventory which they suggest have been worked out.

The guiding principle of the firm's operating plan, is, of course, the *ex-ante* maximization of the difference for the expectation interval between discounted sales proceeds and discounted prime costs. It is the task of management to select from alternative income-outgo streams the one which promises the highest capital value. A characteristic of this stream which is particularly instructive for present purposes is that the discounted marginal revenue and the discounted marginal cost for one date are equalized as closely as is possible with one another *and* with the marginal revenues and marginal costs discounted from the remaining dates in the operational period. Any plan which fails to substitute a higher for a lower discounted marginal revenue or a lesser for a greater discounted marginal cost, where substitution is possible, falls short of the optimum.[6]

[6] In the short period, intertemporal substitution between outputs and marginal costs is not complicated by the problem of joint costs. With plant capacity given the joint costs of O_1 and O_2, say, are in the category of supplementary costs.

Inventory is the product of the desynchronization of output and sales that intertemporal substitutions of discounted marginal revenues and discounted marginal costs require. Profitable opportunities for substitution are opportunities to obtain a positive net yield upon investment in inventory. The capital value of inventory is the sum of the discounted gains to be won by substitution, and it is maximized when the capital value of the enterprise is maximized.

There is an evident parallelism between the theories of inventory accumulation and discriminating monopoly. The former defines optimum distribution of a total supply between markets that are separated in time. The latter defines optimum distribution of a total supply between markets that are separated in space. Assuming appropriate discounting of future quantities, the definitions of optima are identical: ". . . . profits will be at a maximum when the marginal revenue in each market is equal to the marginal cost of the whole output."[7] In the analysis that follows, the parallelism has been exploited rather intensively. Two of the three detailed studies of inventory problems employ variants of graphical techniques which Professor Yntema and Mrs. Robinson have developed in their investigations of monopolistic discrimination.[8]

The theory of inventory in its most general form actually applies only to monopolistic or imperfectly competitive firms, specifically those which sell at a variable price. Special qualifications are necessary both for the perfectly competitive concern and for the concern which quotes just one price in the short run regardless of changes that occur in demand and cost functions. There follows a brief summary of the results to be obtained below by applying the analytic model previously explained to the three types of firm.

[7] J. Robinson, *The Economics of Imperfect Competition* (London, 1936), p. 181. My colleague, Mr. Jastram, originally drew my attention to the monopolistic analogy.

[8] See below, Figs. 1 and 6. Robinson, *ibid.*, pp. 182–83; T. O. Yntema, "The Influence of Dumping on Monopoly Price," *Journal of Political Economy*, XXXVI (1928), 686–98. Professor Elmer D. Fagan has directed me to the pioneering of Sir Sidney Chapman in the theory of discrimination. See Chapman's *Outlines of Political Economy* (New York, 1911), pp. 177–82.

III

It becomes profitable for the imperfectly competitive firm which sells at a variable price to invest in inventory when increases, in the schedule sense, in either demand or cost are anticipated for late portions of the expectation interval. The returns accrue from (1) substitution of deferred sales at relatively high marginal revenues for immediate sales at relatively low marginal revenues, (2) substitution of immediate output at relatively low marginal costs for deferred output at relatively high marginal costs, and (3) expansion of immediate output and deferred sales beyond the limits which are necessary to exploit opportunities for substitution alone. The stimulus to investment in inventory for the concern which sells at a conventional price may be either adverse cost prospects or a forecast of increasingly absorbent markets. But the yield to inventory arises only from the substitution of immediate for deferred output. While both types of imperfectly competitive concern can accumulate stocks to temper the impact of rising factor prices, the perfectly competitive concern will produce ahead of current sales requirements only for the purpose of exploiting to the utmost the anticipated increases in selling price. In the typical case of perfect competition the yield to inventory consists simply of the gains obtained by substituting deferred for immediate sales of current output. Imminent change in the cost function may induce the perfect competitor to amend his forecasts of demand and to engage in production for stock, but it has no direct significance for current rates of output and sale.

In all three cases accumulation of stocks is limited by the condition that the marginal unit must return an amount that is adequate to cover marginal interest and storage charges as well as a marginal allowance for risk. In all three cases stocks on hand are a deterrent to new production for stock: either because the opportunities for intertemporal substitution and discrimination are limited or because the marginal allowance for risk is an increasing function of inventory commitments or for both reasons. This is, of course, simply a special application of a general principle which is very familiar to capital theorists: as Mr. Keynes

puts it, ". . . . the marginal efficiency of capital depends . . . . on the existing abundance or scarcity of capital goods. . . . ."[9]

In the most general case, for the imperfectly competitive concern which sells at a variable price, variations in inventory actively condition price policy. While investment in stock is under way, price rises on the market against which discrimination is practiced. During disinvestment in stock, price falls on the market which benefits from discrimination. Again the results are simply special applications of familiar doctrine.[10] A fair approximation to reality may be claimed for these results and the ones preceding, not only because account is taken of market imperfections but also because the analytic model makes provision for the hazards of forecasting in an uncertain world as well as for the progressive adaptation over a series of planning dates of entrepreneurial expectations to market experience.

Finally, the analysis that follows suggests the essential unity of price and capital theory which static methods have done much to conceal. It is demonstrated, for example, that the market-period problem of disinvestment in inventory must be solved simultaneously with the short-period problem of output rates: liquidation of inventory displaces new output, and the rate of liquidation is governed by the character of the short-period cost and demand functions. Since the disposal of inventory qualifies as a problem in capital theory, a breach in the static wall between market-period and short-period analysis is a step toward the unification of economic theory into an organic whole.

IV

This section and the two to follow are concerned with representative operating problems and their solutions on two successive Mondays for the three types of enterprise.[11] Because it is rela-

[9] J. M. Keynes, *The General Theory of Employment Interest and Money* (New York, 1936), p. 315.

[10] Thus Yntema, with regard to dumping in international trade: "If the typical situation in the short run with given fixed plant involves increasing marginal costs, dumping would increase domestic prices" (*op. cit.*, p. 697).

[11] The list of specific case studies can, of course, be extended well beyond the three in the text. For example, one may replace the linear functions that are as-

tively less general, the case of the perfectly competitive concern will be considered first.

Figures 1 and 2 summarize the calculations of the perfect competitor for Monday of week 1 and define the optimum operating plan for the expectation interval of weeks 1 and 2. In these figures aa' indicates the marginal-revenue curve anticipated for week 2;

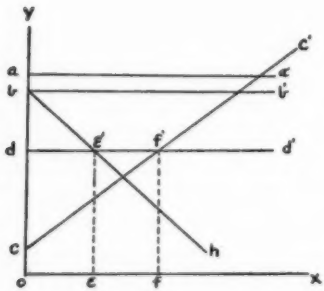

FIG. 1

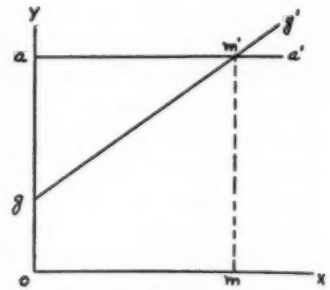

FIG. 2

FIG. 1.—Determination of O_1, S_1, and I for the perfect competitor on Monday of week 1. x axis: physical volume of O_1, S_1, and I; y axis: marginal costs week 1, marginal returns weeks 1 and 2.

FIG. 2.—Determination of O_2 for the perfect competitor on Monday of week 1. x axis: physical volume of O_2; y axis: marginal costs week 2, marginal returns week 2.

bb' equals aa' discounted for interest costs and storage charges on stocks produced in week 1 for sale in week 2;[12] bh, bb' discounted

sumed with curvilinear functions. In the writer's judgment the change vitiates none of the general conclusions. In the imperfectly competitive cases, diminishing marginal costs may be substituted for increasing marginal costs: the consequences for inventory policy can be worked out very simply from the models.

[12] The assumption that marginal costs for interest and storage are constant in the case of perfect competition is perfectionist but convenient. It would be more realistic, if a little less convenient, to assume that loans and storage services will be forthcoming at rising marginal costs. This is done in the cases of imperfect competition.

For geometric convenience no anticipated cost or demand functions for week 2 have been adjusted for either interest and storage costs or an allowance for risk, except when they figure directly in the calculations relating to the size and disposition of inventory. The appropriate corrections are made easily in algebraic versions of the demonstration.

by increasing marginal allowance for risk;[13] dd', the marginal revenue curve for week 1; $be'd'$, the sum of bh and dd', the aggregate marginal revenue curve for supplies that are salable in either week 1 or week 2;[14] cc', the curve of marginal costs of production in week 1; and gg', the curve of marginal costs of production in week 2.

The optimum operating plan for Monday of week 1 can be summarized very briefly as follows: $O1 = of$, $S1 = ef$, $I = oe$, $O2 = om$, $S2 = oe + om$. The right figure for $O1$ is of, for the reason that at f' the marginal cost of producing a total supply which may be diverted to two markets is equal to marginal revenue on either of the markets. $S1$ must be ef, and I must be oe if discounted marginal revenues are to be the same on both markets.[15] $O2$ is determined by the intersection m' in Figure 2, between the curves of marginal costs of production and marginal revenues of week 2 which are to be regarded as subject to discount for interest alone. $S2$ must be $oe + om$ to satisfy the definition of the expectation interval. This plan fulfils the conditions for maximizing the profits of intermarket discrimination, the capital value of inventory, and the capital value of the enterprise.

Clearly, production for stock is contingent upon an expected rise in selling price: unless aa' lies above dd' all of $O1$ will be sold at once. Furthermore, one may assume that total output in the plan of Monday of week 1 is likely in the typical case to be

[13] The marginal allowance for risk is an increasing function of the proposed volume of inventory: the conviction that inventory will pay its way is probably relative to the amount of resources committed. The rate of increase in the marginal allowance depends principally upon the management's confidence in its forecasts of conditions in week 2. It may be suggested, in passing, that the typical slope of the producer's risk-allowance can be a decisive factor in the development of a professional speculative class. For two very instructive discussions of the principle of increasing marginal risk, the reader is referred to N. Kaldor, "Speculation and Economic Stability," *Review of Economic Studies*, VII (1939), 5, and M. Kalecki, "The Principle of Increasing Risk," *Economica*, IV (1937), 442.

[14] Figure 1 is an adaptation of the familiar diagrammatics of discriminating monopoly to the case of perfect competition.

[15] A curve of marginal efficiency of investment in inventory is derived very simply from Fig. 1. By simple draftsmanship one can demonstrate that at oe marginal efficiency is equal to the rate of interest interpreted either as a market rate or as an internal rate.

unaffected by inventory policy; in view of the timorousness and lack of resources of the competitive producer, *bh* is seldom to be expected to intersect *cc'* to the right of *f'*. Retention of goods in stock merely requires that marginal opportunity costs, present returns foregone, be less than discounted marginal returns in the future.

Anticipated changes in the cost function in late portions of the expectation interval have no direct bearing on inventory policy. The position of *gg'* relative to *aa'* and *cc'* is irrelevant to the locus of the point *e'*, which is definitive for inventory. Marginal cost in week 2 is fixed by the price expected to prevail in week 2, so that the question of displacing later output and high marginal costs does not arise. There is no incentive to escape rising factor prices by storing the produce of cheap labor and materials or to delay production until factor prices shall have fallen. Of course, changes in *gg'* may be comparatively easy to forecast and may induce the management to re-estimate *aa'*, so that prospective variations in the cost function may have an indirect impact upon investment in inventory.

Suppose now that the entrepreneur has acted according to the optimum plan for week 1 and is considering the new situation which faces him on Monday of week 2. Stocks of *oe* are on hand; cost and demand functions for week 2, now precisely known, are probably not in perfect accord with expectations; the expectation interval now includes week 3. The new problem and its solution are demonstrated in Figures 3 and 4. Figure 3 differs from Figure 1 only in that the marginal cost curve for the current week is shifted to the right from the *oy*-axis by the amount of carry-over at hand and the functions are dated one week later. The discontinuous curve *oecc'* becomes the new curve of marginal cost for the entire supply, including I and O_2, which is available for sale in either or both weeks of the new interval. Figure 4 is simply Figure 3 with the functions redated.

The details of the optimum plan for the interval week 2 and week 3 are: $O_2 = en$, $S_2 = kn$, $I = ok$, $O_3 = ov$, and $S_3 = ok + ov$. The plan equates the marginal cost of the supply *on*, which is available for sale in either or both of the two weeks, with

marginal revenues on both markets at k' and n'. No opportunity remains to increase the profits of intersale substitution, intermarket discrimination, or investment in inventory.

Figure 3 illustrates the essential unity of market and short-period decisions under dynamic conditions. The locus of the curve $rk'a'$ relative to cc' is evidently dependent upon the volume of carry-over, oe. In extreme circumstances—if price forecasts were optimistic enough and the risk allowance sufficiently mild—k' might lie to the right of n' on cc' if no inventory were in stock.

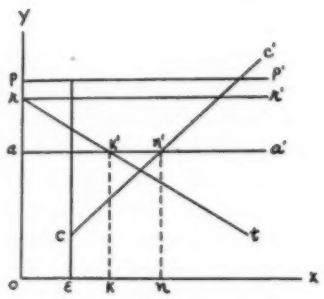

FIG. 3

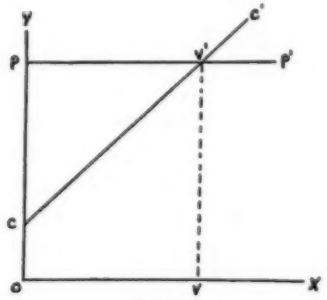

FIG. 4

FIG. 3.—Determination of O_2, S_2, and I for the perfect competitor on Monday of week 2. x axis: physical volume of O_2, S_2, and I; y axis: marginal costs week 2, marginal returns weeks 2 and 3.

FIG. 4.—Determination of O_3 for the perfect competitor on Monday of week 2. x axis: physical volume of O_3; y axis: marginal costs week 3, marginal returns week 3.

The existence of inventory can avert new production for inventory beyond immediate sales requirements. Independent solution of the market-period and short-period problems is clearly liable to error. This is confirmed by reflection upon the fact that, since inventory and new output are eligible for the same markets, they are logically indistinguishable elements of a total supply.

V

It has been indicated above that the yield of inventory to the imperfectly competitive concern which sells at a conventional price consists solely of savings that are made in costs by inter-

output substitutions. The opportunity to substitute and to minimize total discounted costs for an expectation interval may be presented either by an anticipated increase in total sales at the conventional price or by an anticipated rise in factor prices or by both. Substitutions between sales volumes to maximize total discounted revenues are outlawed by the nature of price policy. It is true, however, in this second situation as in the first that, since existing inventory is a deterrent to new production, the market-period and short-period problems are insoluble separately.

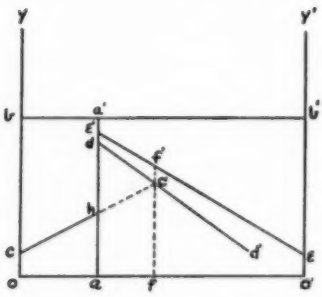

FIG. 5.—Determination of O_1, O_2, and I for the imperfectly competitive firm selling at a conventional price, Monday of week 1. x axis: physical volume of O_1, S_1, O_2, S_2, and I; y axis: conventional price, marginal costs weeks 1 and 2.

The calculations that are required from this second type of firm on Monday of week 1 and the optimum plan to which they point are suggested by Figure 5, where *ob* indicates the conventional price; *oa*, the sales quota for week 1; *o'a*, the sales quota anticipated for week 2, measured from the *o'y'* axis; *cc'*, the marginal cost of production curve for week 1; *ee'*, the curve of marginal cost of production anticipated for week 2, measured from *o'y'* axis; and *dd'* which equals *ee'* corrected for marginal risk, interest and storage allowances is a curve of discounted marginal net savings from interoutput substitution.

The simplest plan for this firm is to produce just enough in week 1 to satisfy sales requirements in week 1 (*oa*) and enough in week 2 to fill the market quota for week 2 (*o'a*). Evidently, though, the hand-to-mouth policy is not the optimum. Since marginal cost in week 1 (*ah*) is less than the discounted value of marginal cost in week 2 (*ad*), the present worth of total costs for the output aggregate (*oo'*) can be reduced by interoutput substitutions. If O_1 is enlarged to *of*, exceeding S_1 by *af*, discounted marginal costs can be equalized at *c'*, with a total saving of *hdc'*.

Production costs hc' in week 1 replace production costs $e'f'$ in week 2, and the marginal gain from the substitution exactly covers marginal carrying charges $f'c'$. It is apparent that a prospective increase of factor prices in week 2, resulting in a shift of ee' upward relative to cc' and c' downward toward d', must increase O_1 and I and reduce O_2.

As of Monday in week 2, inventory af becomes a determinant of the new short-period plan. In Figure 5 provision may be made for the carry-over by shifting the cost curve cc', now defining conditions of output for week 2, to the right from oy, so that c' falls along the redated dd'. The outcome is that production for both weeks of the expectation interval is less than when inventory is nil. Stock on hand displaces new output for both weeks, in the proportions that are required to equalize discounted marginal costs. The displacement effect is attributable to the limited opportunity for substitution, for which the rigid sales volume and the slopes of the cost curves are responsible, as well as to the dampening influence of rising marginal allowances for carrying charges and risk.

VI

The final case, for the imperfectly competitive concern which sells at a variable price, is the most instructive of the three. It is the only one to which the dynamic theory of inventory, designed for the single firm rather than for the industry or some still more inclusive aggregate, is applicable in its most general form. Investment in inventory is stimulated by prospective increases in demand and costs alike. Yield on the investment accrues from intertemporal transfers both of a given sales volume and a given output total and, in addition, from expansion of output and sales in the expectation interval which is rendered profitable by the substitutions. There are no infinitely elastic marginal revenue curves to determine total production costs for the interval and to preclude interoutput transfers; there is no rigid price to determine sales aggregates and prevent intersale transfers. Price is fixed neither by a mass of competitors and customers nor by custom but is an expression of policy. This case, like the others, demonstrates the necessity for simultaneous solution of market-period and

short-period problems by producers wherever economic variation is both continuous and difficult to forecast.

Figure 6 is a geometric summary of the case for Monday of week 1. For the sake of legibility, no provision is made for discounting of the data forecast for week 2. Here aa' indicates the marginal revenue curve for week 1; bb', the marginal revenue curve for week 2; cc' (the sum of aa' and bb'), the aggregate marginal revenue curve for supplies disposable in either or both of the two markets; dd', the marginal cost of production curve for week 1; and $ee' = ff'$, the marginal cost of production curve for week 2, drawn from Y-axes hh' and id', respectively. In Figure 6 the optimum plan is compared with a less profitable alternative. In the latter there is no provision for inventory: $O1 = S1$ and $O2 = S2$. Its principle is that marginal cost in each week is to be equated with marginal revenue in each week and that the markets shall be exploited independently with no attempt at discrimination. The alternative plans are specifically as follows:

PLAN 1	PLAN 2
$O1 = S1 = oh$	$O1 = oi$
$O2 = S2 = hm = oj$	$S1 = og$
$\Delta d = \Delta a = hh'$	$I = oi - og = gi$
$\Delta e = \Delta b = me' = jj'$	$\Delta d(id') = \Delta a(gg') = \Delta f(nf') = \Delta b(kk')$
$hh' < me'$	

The advantages of intertemporal discrimination and investment in inventory are evident. The diversion of gh in sales from week 1 to week 2 means the substitution of marginal revenues along a portion of $j'k'$ for the lesser marginal revenues $h'g'$. The production of lm in week 1 rather than in week 2 permits the firm to escape marginal costs $e'l'$, incurring instead the lower $h'd'$. Besides the gains from rescheduling output and sales equal to om in the aggregate, the negative slopes of the marginal revenue curves assure additional profits from net increases, mn, in output and sales for the entire interval: $jk > gh$ and $hi > lm$.

Figure 5 is easily adapted to demonstrate the results for inventory policy of an anticipated change in the cost function. A rise in factor prices in week 2, for example, can be indicated by shifting the cost curve ee' upward so that the intersection e' rises

along cc'. It is apparent that the potential gains of delaying sales and producing for inventory are increased. No forecast of change in the demand function is needed to produce this effect. Whichever change it may be, in demand or in costs, that presents the opportunity for holding stocks, price policy reflects the adaptation of operating plans. Price is higher in week 1 and lower in week 2 than if intertemporal discrimination were not practiced. Via entrepreneurial anticipations that induce a spurt of invest-

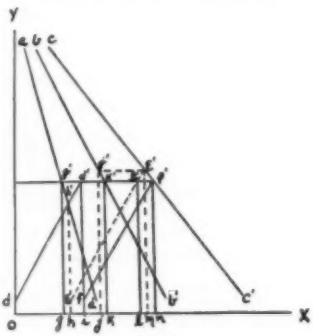

FIG. 6

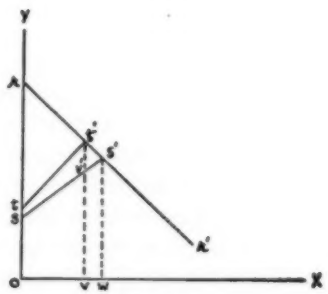

FIG. 7

FIG. 6.—Determination of the optimum plan, as of Monday of week 1, for the imperfectly competitive firm which sells at a variable price. x axis: volume of output, sales, inventory; y axis: marginal costs weeks 1 and 2, marginal returns weeks 1 and 2.

FIG. 7.—Determination of the optimum investment in inventory for the imperfectly competitive concern which sells at a variable price. x axis: volume of inventory; y axis: marginal costs of inventory, marginal returns to inventory.

ment activity, upward pressures upon the prices of final goods cast their shadow before them.

The effects of carrying costs and the risk allowance are suggested in Figure 7, where rr' is the sum of $e'l'$ and $j'k'$; ss', the sum of $h'd'$ and $h'g'$; and tt', the sum of ss' and curve of marginal carrying charges and risk allowance. The curve rr' is a gross marginal productivity curve for inventory, while ss' describes the course of marginal cost of inventory accumulation. The intersection s' fixes the optimum size of inventory at ow ($=gi$ in Fig. 6) when carrying charges are nil and the management has complete confidence in its forecasting. When charges must be met and there

is doubt of the future, the optimum size of inventory falls to *ov*. Marginal revenue and marginal cost in week 1 must fall short of their counterparts in week 2 by the internal discount factor *v'i'*. As compared with their respective levels when no discounting is necessary, O_1, O_{1-2}, S_2, and S_{1-2} are less, while S_1 and O_2 are greater. Discrimination and substitution are discouraged. The streams of receipts and payments are modified so as to bring the former closer in time to the planning date and to defer the latter. Prices, too, are affected: present price declines, the future price rises to signify the change in relative desirability of receipts bearing different dates.

Brief analysis of the problem which confronts the concern on Monday of week 2 will confirm the principle that, under dynamic assumptions, market-period and short-period plans must be derived jointly. The general character of the problem is already familiar. Given demand and cost functions for week 2 that are certain and an expectation interval that includes week 3, the management must determine the disposition of stock on hand as well as the volume and disposition of output for two production periods. The problem and its solution can be demonstrated by amending Figure 6: shift the *Y*-axes of *dd'* and *ff'* to the right from *O* for a distance equal to stock on hand, retaining *OY* as the perpendicular axis for the marginal revenue curves. Assuming all the functions to have the same values on Monday of week 2 as on Monday of week 1, the results may be summarized as follows: output in both weeks of the interval is reduced; sales in both weeks of the interval are increased, at lower prices; and, depending upon the relative elasticities of the marginal revenue curves for weeks 2 and 3, *ex-ante* investment in inventory is diminished.

VII

It is not necessary or even desirable that dynamic analysis should displace either the stationary-state or the static method of approach to the problem of inventory. "The stationary state is that special case of a dynamic system where tastes, technique and resources remain constant thru time."[16] Erratic changes in cost and demand functions are outlawed and so, of course, are the in-

[16] Hicks, *op. cit.*, p. 117.

centives to inventory accumulation which have been described above. If inventory exists, its amount must be constant and a new set of motives for its maintenance must be found. At least three motives, all of which have figured prominently in traditional treatments of the inventory problem, can be mentioned: (1) the desire to minimize transport and transaction expenses on a constant flow of output and sales; (2) the desire to synchronize "seasonally" irregular output with "seasonally" irregular sales; and (3) a factor which is peculiar to imperfect competition, the desire to avoid alienation of customers by scant displays and late deliveries. "Convenience" is a familiar envelope for all three motives. A given rate of interest and a schedule of other carrying charges prevent exploitation of convenience to the point of zero marginal return.

In so far as analysis of the stationary-state variety has its usefulness, and that is not a matter for debate here, the special theory of inventory which it implies belongs in the economist's kit of tools. And it is true that the motive of "convenience" can be translated into dynamic terms and fitted into a complete synthesis of dynamic inventory theory. The important consideration is that care must be taken not to overlook the implications for inventory theory of shifting from one analytic principle to another.

Both the dynamic and the stationary-state techniques of dealing with the inventory problem must be sharply distinguished from the static technique, if argument is to be at all fruitful. Each of the three types of analytic method has its own peculiar restrictions upon the way in which one may define entrepreneurial anticipations of the cost and demand functions. The static method I have in mind is Marshall's. Its essence is the classification of forces affecting output and sales according to operational periods and the absence of any precise principle to unify the independent analyses of the several periods.

In his discussion of the "market period," a designation reserved for factors determining the disposition of supplies "on hand" or "in sight,"[17] Marshall cites a variety of inducements both to hold and to liquidate stocks. "Need for money in hand,"[18] "calcula-

[17] Alfred Marshall, *Principles of Economics* (8th ed.; London, 1927), pp. 378–79.

[18] *Ibid.*, p. 332.

tion of present and future condition of the market,"[19] "estimates of the expenses of producing further supplies,"[20] and the "influence of trade combinations"[21] are typical explanations of day-to-day discrepancies between available supplies and volume of sales. It is regrettable that Marshall simply enumerates the inducements and that he disregards the impact of the market-period upon the short-period plan.

In Marshall's terminology, "short period" is the designation of factors affecting the disposition of established plant facilities over a "given time."[22] If anticipatory decisions regarding inventory were to play any part in the Marshallian system, they would presumably fall within this division. But Marshall assumes that the entrepreneur foresees no possibility of temporary differences between output and sales and makes no plans to augment his profits by fostering such differences. Nowhere in the *Principles*, so far as I have been able to discover, is it suggested that the market-period decision is a corrective decision, adjusting prior plans for inventory to new data that have appeared with the passage of time.

The reason for this is that the Marshallian entrepreneur makes no allowance in his calculations for successive changes in the cost and demand functions. He acts upon a peculiarly simple set of expectations, taking it for granted that one market and one cost situation will endure through the expectation interval.[23] Marshall has a perfectly legitimate reason for adopting this model. His purpose is to determine the full drawing-power of any given price upon output over a specified period, or the "normal" price for any given rate of output continuing over a specified period.[24] Obviously, the complex price expectations which must be assumed in a dynamic theory of inventory cannot be admitted. Correspondingly, there can be no provision for the variable rate of output which typifies a dynamic plan of operations.

Marshall was aware that his analysis was an oversimplification, and he had a sound defense for it.[25] Before the consequences of complex forecasts can be worked out, the analyst must practice

[19] *Ibid.*
[20] *Ibid.*, p. 338.
[21] *Ibid.*, p. 372.
[22] *Ibid.*, p. 379.
[23] *Ibid.*, pp. 373 and 379.
[24] *Ibid.*, p. 372.
[25] *Ibid.*, p. 369.

with simple forecasts. Before output variations can be explained, one must understand the why of a given rate of output. Cycle facts and cycle theory are at last compelling economists to elaborate upon the Marshallian models, just as Marshall himself would have wished. It is reasonable to suppose that the principal innovations—the dating of expectations and the construction of sequences—would be no very great surprise to him.[26]

VIII

It is dangerous to pass directly from an examination of the role that inventory plays in the calculations of a single producer to speculation upon its significance for the national output and income.[27] With due precautions, however, a few points can be culled from the preceding analysis that may have some merit for cycle theory.

On the whole, it should be expected that investment in inven-

[26] The cost of giving up the static method is evidently a loss of confidence in the tendency of economic forces to drive prices and incomes to a position of rest or equilibrium. The cost is not excessive. Marshall himself regarded the concept of equilibrium as a methodological device. If the device restricts analytical progress, the case for dropping it or minimizing our use of it is clear.

Several of the conclusions reached here coincide with results obtained in a different way by Mr. Abramovitz in his book, *An Approach to a Price Theory for a Changing Economy*. Mr. Abramovitz explains the dependence of an adequate theory of inventory upon the admission to price theory of multiple price and cost expectations (pp. 47–48, 53, 95, 105). He insists upon the essential unity of all decisions affecting the capital value of the enterprise (p. 112). He distinguishes between anticipatory and market decisions affecting inventory (pp. 118–21). He notes the fact that anticipated changes in the cost function are irrelevant to inventory policy under pure competition (p. 106). The similarity in conclusions is striking, in view of the fact that the two analyses were made independently and employed quite different techniques. The principal dissimilarities in our results are due to the facts that Mr. Abramovitz has not dealt with the cases of imperfect competition, that he has devoted his most refined analysis of the inventory problem to the industry rather than to the individual firm, and that his most precise model sequence explaining an industry's investment in inventory is based on the assumption of perfect foresight (p. 112). There are points of actual disagreement, but they are not sufficiently important to justify argument here.

[27] Mr. Kaldor's "Speculation and Economic Stability," in the *Review of Economic Studies*, Vol. VII (October, 1939), is an excellent and much more exhaustive treatment of the role of stocks in system-wide variations than can be attempted here. The discussion above is intended to show simply the applicability or adaptability of the technique developed in previous sections to problems that extend beyond the individual firm.

tory acts as a destabilizer in the course of the cycle. In recession and deep depression the dynamic incentives to accumulation of inventory are typically weakest. Then firms are working along the more or less horizontal reaches of their marginal cost curves. They are too pessimistic to hazard any very sanguine forecasts of the markets' future. Factor prices are on the downgrade. In recovery and boom, on the other hand, the dynamic incentives are probably at their strongest. Operations are verging on the more sharply inclined segments of the marginal cost curve; and fact, as well as fancy, encourages optimistic forecasting of market conditions, while factor prices are tending to harden.

A quite different pattern of inventory behavior is conceivable. During a lengthy depression bottlenecks develop, in the sense that curves of marginal cost are pinched upward and to the left. Dispersion of labor supplies and lax replacement, for example, tend to contract the horizontal stretches of the curve. As a result, the opportunity to profit by interoutput substitutions may arise. Furthermore, in deep depression entrepreneurs tend to develop an almost neurotic antipathy to the long-period forecasting that is essential to investment in durable equipment. The first glimmer of recovery may then be outlay on inventory, in response to short-range forecasts of improving sales. Inventory becomes the first testing-ground of brighter expectations. If the trial fails, recovery is delayed; if it succeeds, measures may be taken upon the basis of more extended forecasts.

In any case, it is incumbent upon the control authorities to eschew any set definition of an "appropriate" or "sound" level for salable stocks. Sharp expansion in the early stages of recovery may both stimulate and feed upon strong advances in the prices of finished goods and raw materials alike. Under certain circumstances these price advances may be a necessary stimulus to the lengthening of the expectation interval and the elimination of bottlenecks by plant replacement and expansion that are essential to adequate recovery. The inventories will be "speculative" in character, but it is the renewal of the speculative spirit that is required. If investment in inventory is the first tentative experiment with the future, repressive action by the authorities can

result only in throwing the whole burden of recovery back upon public agencies.

In view of Mr. Hawtrey's eminence in the field of inventory theory, it is only suitable that a brief comparison of his doctrines with those developed here should be made. It is evident that the latter leave one much less confident of the powers of the short-term rate of interest than do the former. The principal source of disagreement is that in Mr. Hawtrey's opinion the dynamic incentives do not seriously affect the producers of finished goods.[28] While he concedes that raw-material prices vary considerably, he argues that the prices of manufactured articles are relatively stable, and it is his impression that dealers make no effort to forecast price changes.[29] Generally they act as though they were operating on a conventional-price market. Furthermore, Mr. Hawtrey believes that forecasts of change in demand at the given prices are rare and do not afford a basis for building stocks.[30] Presumably he would outlaw prospective changes in the cost function as well.

Mr. Hawtrey is left with a marginal productivity curve for inventory that is based exclusively upon the factor of convenience. It would fit ideally the specifications of the stationary-state type of analysis. Evidently Mr. Hawtrey supposes the curve to be both moderately elastic and very stable over time. In order to complete his case for the efficacy of the short rate of interest, he takes the position that other carrying charges than interest are small and constant.[31]

It may be that the data will bear out Mr. Hawtrey's model of inventory determinants. Until the data are available in convenient form, however, it will be well to qualify Mr. Hawtrey's rules of policy for the special assumptions that his model requires. Even if the data eventually bear him out, the incorporation in price theory of the dynamic incentives and deterrents will still be necessary on methodological grounds.

[28] R. G. Hawtrey, *A Century of Bank Rate* (London, 1938), p. 193.

[29] R. G. Hawtrey, *Capital and Employment* (London, 1937), p. 117.

[30] *Ibid.* [31] *A Century of Bank Rate*, p. 194.

ADAM SMITH'S EMPIRICISM AND THE LAW OF NATURE. I*[1]

HENRY J. BITTERMANN
Ohio State University

I. THE PROBLEM STATED

ADAM SMITH was both the founder of a science and the prophet of an economic and political creed, and the combination and possible confusion of scientific and normative[2] elements in the *Wealth of Nations* has long provided material for the critics. There were advocates of laisser faire long before Smith, and it may well be contended that economic liberalism was but one aspect of broader philosophic, literary, and political movements of the time directed toward the emancipation of the individual from traditional social controls of thought and action. In formulating his economic theories Smith utilized the arguments and conclusions of a host of writers. His preeminence is due to the fact that he first integrated various theories into a "system"; he showed how an economic order with a minimum of state action could function as a going concern; by comparing the effects of laisser faire and intervention in economic matters, he argued that per capita real income would be greater in the absence of control. With some important qualifications he concluded that the interests of society, by which he

* Part II will appear in the October issue.

[1] Professors A. B. Wolfe, Arthur Salz, and R. S. Crane and Dr. Julius R. Weinberg offered many valuable criticisms and suggestions when they read an earlier draft of this essay. Though their suggestions have not all been incorporated, their aid is gratefully acknowledged.

[2] Certain concepts are basic to the argument of this essay, and to avoid possible confusion they will be tentatively defined here. By "scientific" propositions are meant those which state, or purport to state, conditions or relations of empirically observed or observable phenomena. The copula of such propositions must be of the form "is" or "is not." As here used the term is equivalent to Pareto's "logico-experimental" or J. N. Keynes's "positive." As used here the term need not imply full acceptance of a positivistic or even completely empiristic position. By "normative" propositions are meant statements of criteria of value judgments, prescrip-

understood the interests of the sum of individuals in the group, would be best served by permitting each one to pursue his own interest in his own way.

The transition from analytic conclusion to normative prescription was easily made, often without clear indication. Many of the historians of economic doctrine have held that a harmony of interests was a presupposition of Smith's analysis; that ultimately economic theory and practical program depended on his belief in a natural order of the universe, part of the rational theology of the time. Others have seen a close intellectual kinship with the writers on natural law in jurisprudence and political theory. To analyze in detail the arguments of Smith's critics and their points of agreement and disagreement would be, to say the least, a weary and inconclusive task, involving a review of much of the methodological controversy of the last century. Criticism was most pronounced in Germany, where Smithianism was part of a brief interlude of *Aufklärung* between stages of interventionist policy and of its theoretical defense, learnedly supported, in part, by the mental confusion of Romanticism, Hegelianism, and nationalistic historism. Thus there were analyses of varying degrees of profundity of Smith's method and assumptions,[3] his consist-

---

tions, statements of ideals or ends, or the application of such criteria to questions of "fact." The copula is of the form "ought" or "ought not."

By "empiricism" is meant the theory that knowledge is, and can be, obtained only from sense experience. Generalizations (principles or laws) are summary statements of observed similarities and regularities of phenomena, whose predictive value rests on probability. "Rationalism" is here defined in the narrower, epistemological sense rather than in the broader sense as used in, say, Lecky's *Rise and Influence of Rationalism in Europe*. Theories are regarded as rationalistic when propositions are derived by deduction from primitive propositions, assumed as given, intuitive, self-evident, or a priori. Such propositions may be epistemological, ethical, political, or even physical. The validity of generalization thus depends upon the correctness of the primitive propositions and the logic of deduction rather than upon agreement or disagreement with observation. In practice philosophers have combined empirical and rationalistic methods—perhaps Hume was the only strict empiricist—but the heuristic value of the distinction is not thereby destroyed.

[3] Most members of the historical school gave some attention to these issues, though they were not in full agreement. For the details of their opinions see Feitel Lifschitz, *Adam Smiths Methode im Lichte der deutschen nationalökonomischen Litteratur des XIX. Jahrhunderts* (Bern, 1906).

ency, and even attacks on his literary and scientific honesty.[4] Probably the most notable of these studies were the scholarly essays of Hasbach,[5] who tried to show the relation of the Smithian system of natural liberty to the theories of natural law in metaphysics, jurisprudence, and political theory and its dependence on the naturalistic ethics and theology of Shaftesbury and Hutcheson. The discussion has not, however, been confined to German. John Rae, as early as 1834, objected to Smith's method as unscientific and metaphysical.[6] Cliffe Leslie emphasized Smith's natural theology and attributed the doctrine of laisser faire to it in large part.[7] More recently Veblen followed the same line of argument in his attacks on the classical method.[8] With some variations these conclusions have been widely accepted[9] in

[4] E.g., Witold von Skarżyński, *Adam Smith als Moralphilosoph und Schoepfer der Nationaloekonomie* (Berlin, 1878); this work by an avowed disciple of List and Dühring accuses Smith of plagiarism, among others, of the writings of Hume.

[5] Wilhelm Hasbach, *Die allgemeinen philosophischen Grundlagen der von François Quesnay und Adam Smith begründeten politischen Ökonomie* (Leipzig, 1890) and *Untersuchungen über Adam Smith und die Entwicklung der Politischen Ökonomie*, (Leipzig, 1891).

[6] *Statement of Some New Principles on the Subject of Political Economy* (Boston, 1834), pp. 332 ff.; edited by C. W. Mixter as *Sociological Theory of Capital* (New York, 1905), pp. 329–58.

[7] "The Political Economy of Adam Smith" (1870), reprinted in his *Essays in Political Economy* (London, 1888), pp. 21–40.

[8] "The Preconceptions of Economic Society" (1899), reprinted in *The Place of Science in Modern Civilization* (New York, 1919), esp. pp. 114–32. Veblen here describes Smith's teleology as "animistic."

[9] E.g., Alexander Gray, *Development of Economic Doctrine* (London, 1934), p. 125; L. H. Haney, *History of Economic Thought* (New York, 1913), pp. 182–83; Charles Gide and Charles Rist, *History of Economic Doctrines* (New York, n.d.), pp. 53–54, 109; Paul Mombert, *Geschichte der Nationalökonomie* (Jena, 1927), pp. 241–43; Werner Sombart, *Die drei Nationalökonomien* (Munich, 1930), p. 41; René Gonnard, *Histoire des doctrines économiques* (Paris, 1930), pp. 302–5; J. K. Ingram, *History of Political Economy* (New York, 1907), p. 91; James Bonar, *Philosophy and Political Economy* (London, 1922), pp. 172–80; Karl Pfibram, *Die Entstehung der individualistischen Sozialphilosophie* (Leipzig, 1912), pp. 96 ff.; J. Jastrow, "Naturrecht und Volkswirtschaft," *Jahrbücher für Nationalökonomie*, CXXVI (1927), 689–730; J. R. Commons, *Institutional Economics* (New York, 1934), pp. 159–69; Gunnar Myrdal, *Das politische Element in der nationalökonomischen Doktrinbildung* (Berlin, 1932), pp. 73–77, 163–65; Goetz Briefs, *Untersuchungen zur klassischen*

the literature and have even found their way into an elementary text.[10]

The commentators on Smith's naturalism who have noted a close relation to natural law and natural theology have adduced a variety of evidence, some of it direct, as when Smith spoke of "natural" liberty or when he referred to the invisible hand; some of it indirect, as when it is held that the harmony of nature was an assumption derived from Hutcheson's theology. It is evident enough that Smith was indebted to Cicero, Grotius, Pufendorf, and Hutcheson for some of his ideas, illustrations, and expressions, both in the *Theory of Moral Sentiments* and in the *Wealth of Nations*. It is easy, therefore, to attribute to Smith some of the ideas of his predecessors and to supply the gaps in his own exposition from their theories, particularly since he did not always state his assumptions or how he differed from the writers whom he cites. His style itself, especially the florid rhetoric of the *Moral Sentiments*, is a fruitful source of confusion. Thus, he was an individualist with a firm belief in private property. He followed Locke in point of time, was familiar with his works, shared some of his prejudices, and in a few places used phrases that at once suggest Locke. It may then be concluded that Smith followed Locke's reasoning. Smith borrowed ideas from Pufendorf, he discussed economic phenomena in terms of relatively simple regularities, and so it is concluded that he was influenced by the natural-law school of jurisprudence and applied their method to a new area. He admired his teacher, Hutcheson, followed his precedents in his teaching, and accepted some of his theology, so that the critics have found in Smith a development of Hutcheson's views. And no doubt Smith was influenced by all these sources.

But the argument of historical continuity is particularly deceptive when applied to the development of ideas, for it tends to neglect a host of other influences on the thinking of any one man. In Smith's case it neglects the influence of Hume, whom he called "by far the most illustrious philosopher and historian of the

Nationalökonomie (Jena, 1915), pp. 212–16; Günther Hoffmann, *Adam Smith' [sic] Philosophie in ihrem Verhältnis zur Naturrecht und Volkswirtschaft* (Charlottenburg, 1930), *passim*.

[10] B. W. Knight, *Economic Principles in Practice* (New York, 1939), pp. 7–10.

present age"[11] and from whom, he said, he differed "a little." While the critics have often noted Hume's influence on specific points, they seem to have neglected Hume's philosophic influence on Smith. Yet Hume's achievements as a philosopher were to upset a rationalist epistemology involving self-evident ideas, to question the assumptions commonly made about causation, and to attack with telling blows the arguments of natural theology. His political theories were directed against natural law and natural rights. It is, of course, quite possible that Smith completely refused to accept his closest friend's conclusions, but he could scarcely have passed over the published arguments without comment, and, in fact, in several places he points out his express disagreement with Hume. The high praise of Hume would probably not have been applied to an author whose conclusions he thought were erroneous. Likewise Hume, though he criticized various points of Smith's ethical and economic theories, did not charge him with adherence to notions which he himself had refuted.[12] Their silence cannot be regarded wholly as friendly forbearance; rather it indicates considerable agreement on fundamental issues.

It is proposed in this essay to re-examine the question of Smith's naturalism, to analyze his methodology in its bearing on the assumptions of natural law and natural theology, in order to determine to what extent Smith's normative economics rested on these theories. In the course of the discussion the vexed question of the relationship between the *Theory of Moral Sentiments* and the *Wealth of Nations* must be raised, since so many of the critics have used these works to interpret one another. It will be contended that Smith's empiricism gave a quite different orientation to his ideas of science, nature, and theology than that postulated by those who have attributed great importance to natural law and theology.

The long and involved doctrinal development of the natural-

[11] *Wealth of Nations*, V, i, Part III, art. 3 (Cannan, II, 275). In all references to the *Wealth of Nations* the book and chapter are given in Roman figures; the second part of the citation refers to the volume and page of the edition by Cannan (3d ed.; London, 1922).

[12] J. Y. T. Greig (ed.), *Letters of David Hume* (Oxford, 1932), I, 303–6, 312–13; II, 311–12.

law theory cannot be reviewed here, for it has appeared with variations throughout the history of political speculation from Aristotle and the Stoics down to modern times.[13] Only a few aspects which seem most relevant to Adam Smith's position will be noted. Stripped of complications and variations, the theory argued that there was an ethical law of nature, discoverable by reason alone, that was uniform through time and place; that this law was an ideal pattern to which positive laws, public policy, and individual conduct should conform; that this law had a divine origin; and that conformity to it was essential for accomplishing the divine plan.[14] In the form given to the doctrine by Roman Stoicism and Roman law it provided many principles for the scholastics and the legal theorists of the seventeenth and eighteenth centuries. With the Reformation, differing theological theories made it difficult to win acceptance of ideas based on any one interpretation of revelation. With the rise of national states and the internal and external conflicts incident thereto, political and juristic theory needed other sanctions than traditional custom and law, if it was to state principles that would reduce conflict and reform jurisprudence. Hence, with the barest elements of theological reasoning and legal practice as accepted principles, the great theorists of international law reformulated the doctrine of natural law in terms of "pure reason," and in this form, in the

[13] Cf. C. E. Vaughan, *Studies in the History of Political Philosophy* (Manchester, 1925), Vol. I; Otto Gierke, *Natural Law and the Theory of Society, 1500 to 1800*, ed. Ernest Barker (2 vols.; Cambridge, 1934), esp. editor's Introduction; David G. Ritchie, *Natural Rights* (London, 1895), chap. ii; Sir Frederick Pollock, "History of the Law of Nature," *Essays in the Law* (London, 1922), chaps. ii–iii; George H. Sabine, *History of Political Theory* (New York, 1937), chap. xxi.

[14] Cicero in the *Republic* thus states it: "There is in fact a true law—namely right reason—which is in accordance with nature, applies to all men, and is unchangeable and eternal. . . . . Its commands and prohibitions always influence good men, but are without effect on the bad. To invalidate this law by human legislation is never morally right, nor is it permissible ever to restrict its operation, and to annul it wholly is impossible. . . . . But there will be one law, eternal, and unchangeable, binding at all times upon all peoples; and there will be, as it were, one common master and ruler of men, namely God, who is the author of this law, its interpreter and its sponsor. . . . ." This translation is that of G. H. Sabine and S. B. Smith, *Cicero on the Commonwealth* (Columbus, Ohio, 1929), pp. 215–16 (cf. Cicero, *De re publica*, ed. K. Ziegler [Leipzig, 1915], pp. 95–96). This particular passage was well known in the Middle Ages and to Grotius and Pufendorf.

opinion of many scholars, it served a valuable purpose.[15] Natural laws were deduced from reason directly or from the social nature of man or from the nature of man and society. Its chief exponents held that the law of nature could not be discovered from empirical evidence, since it was invariable, while positive law exhibited many contradictions.[16] Locke, like Pufendorf, stated his doctrine of natural rights in terms of the conditions prevailing in a state of nature, thought of abstractly rather than historically, in which men lived justly and peacefully, by and large, and from which they preserved their rights to person and property when they formed governments by the social contract. To Locke also the law of nature was reason and the will of God.[17] Francis Hutcheson, however, based his argument on an induction of Divine Providence and regarded as natural laws the rules of conduct which tended most effectually to promote "the greatest happiness and perfection" of mankind. He took "human affections" rather than reason as his point of departure, but when he dealt with many concrete issues his "moral sense" gave certain and direct judgments quite as easily as the right reason of his predecessors. He also accepted Locke's doctrines of the state of nature and natural rights with some qualifications, particularly regarding property rights.[18]

It is fully realized that these brief characterizations of the theories of the men who greatly influenced Smith's thought are not adequate statements, but limitations of space prevent fuller treatment. It will be shown that Smith differed in most important re-

[15] Cf. Arthur Salz, "Ueber einige Beziehungen des Naturrechtes zur Sozialphilosophie," *Archiv für Sozialwissenschaft und Sozialpolitik*, XXXIX (1927), 525–56; Jastrow, *loc. cit.*; Sabine, *op. cit.*, pp. 425–29. Says Professor Salz: "Wenn das Naturrecht ein Irrtum ist, so hat es kaum je einer fruchtbareren gegeben" (p. 538).

[16] For the doctrinal differences cf. Gierke, *op. cit.*, esp. II, 289 ff. Grotius used the criterion of right reason; Pufendorf, "the rational and social nature of man." Cf. Grotius, *De jure belli ac pacis* (1625, 1646), reprinted by the Carnegie Institution (1913), Book I, chap. i, sec. 10, p. 4; sec. 12, p. 6; and, in the same series, see Pufendorf, *De officio hominis et civis* (1673) (New York, 1927), Book I, chap. ii, sec. 16; and *De jure naturae et gentium* (1672) (Oxford, 1934), Book I; Book II, chap. iii.

[17] *Of Civil Government*, chap. i, sec. 6; chap. v, sec. 26 ff.; chap. ix, sec. 135.

[18] *System of Moral Philosophy* (2 vols.; 1755), pp. 1, 29–35, 169–220. For a discussion of the development of Hutcheson's thought see W. R. Scott, *Francis Hutcheson* (Cambridge, 1900).

spects from these writers. He rejected reason as an important determinant of conduct; he tried to discover the principles of morals empirically; he recognized the variation of moral rules with time, place, and circumstance; he rejected the notion of a social contract; he saw a coincidence of his empirical results and the implications of Providence but did not draw his most important conclusions from the divine order.

Hume's philosophic influence on Smith, it seems, ought not to be neglected, for Smith accepted many of Hume's conclusions, and, though they may have disagreed on theology, Hume's arguments could not have been wholly without effect. Hume attacked rationalism (in the narrower sense) in ethics and theology. In his strictly empirical epistemology reason consisted merely in the comparison of ideas, the copies of sense impressions; it could note relations among the data of experience; it could determine the probable consequences of action; but it could not oppose the passions or direct the will. Hence, he rejected theories that asserted that moral conduct was "conformity to reason" and found the basis for morals in sentiments, in pleasure and pain. Morality was that which was approved of as conducive to either public or private utility.[19] The uniformity of sentiments is sufficient to infer the existence of moral rules, but not so great as to justify any immutable precepts.[20]

Accordingly, Hume rejected political doctrines which tried to deduce principles from the rational and social nature of man and which asserted the universality and invariability of ethical norms applicable to the state. The Grotius school had made an effective, though erroneous, argument for greater humanity in public affairs. Its error consisted in deriving from reason principles which

[19] *Treatise of Human Nature*, Book III, secs. 1–2; *Enquiry concerning Human Understanding*, Sec. VIII, Part I, in L. A. Selby-Bigge (ed.), *Hume's Enquiries* (Oxford, 1936), p. 83; cf. also *Enquiry concerning the Principles of Morals* in *ibid.*, p. 173. There is not complete agreement among the critics as to Hume's ethics or theology. Cf. B. M. Laing, *David Hume* (London, 1932), chap. viii; R. Metz, *David Hume: Leben und Philosophie* (Stuttgart, 1929), chap. ii; John Laird, *Hume's Philosophy of Human Nature* (London, 1932), chaps. vii–viii.

[20] Hume's own uncertainty on this score is evidenced in his "A Dialogue" in T. H. Green and T. H. Grose (eds.), *Essays, Moral, Political and Literary by David Hume* (London, 1882), II, 289–305.

were to be justified only on the grounds of utility. The rules of justice were mere artificial conventions which arose historically and were useful in controlling the selfishness of man in a world characterized by material scarcity.[21] Hume also conceded propaganda value to the "philosophic fiction" of the state of nature and the social contract. It had no more historical or philosophic basis than the Leviathan or the theory of patriarchal origin. Rights were merely accepted rules of public utility.[22]

Hume's discussion of natural religion is particularly important in view of the emphasis placed on Smith's natural religion by some of the commentators. Smith undoubtedly knew the *Treatise* and *Enquiries* and probably also had seen the manuscript of the *Dialogues concerning Natural Religion* before he wrote the *Moral Sentiments*.[23] How skeptical of natural theology Hume really was is not certain, and Smith apparently did not consider him a complete skeptic. Hume escaped personal responsibility for his position by the use of the dialogue form, in which the speakers are fictitious Greeks, and the form of an address to the Athenians by Epicurus. When writing *in propria persona*, he asserts some belief in a natural—i.e., nonmiraculous—theology, which conceded the principle of design, though this may have been mere tactical precaution.[24]

[21] *Treatise*, Book III, Part II, secs. 1–5; *Enquiry concerning Morals*, sec. III.

[22] *Treatise*, Book III, Parts V, VII, IX; *Enquiry . . . . Morals*, secs. III–IV; "Of the Original Contract," Green and Grose, *op. cit.*, I, 443–60; "Of the Origin of Government," *ibid.*, pp. 113–17.

[23] Smith's personal acquaintance with Hume dates from 1750 or possibly earlier. He apparently did not receive a presentation copy of the *Enquiries*, and the tale of their confiscation while he was a student at Oxford, if true, referred to a purchased copy. The *Dialogues* were written about 1751, and the manuscript was circulated among Hume's friends, probably including Smith. They all advised against publication, and Smith was unwilling to have the work appear before his own death. What his "many reasons" were must be a matter of conjecture. From one of his letters it seems that he regarded the *Dialogues* as unfit for general circulation and preferred to have their arguments known only to a few. Cf. John Rae, *Life of Adam Smith* (London, 1895), pp. 15, 45–48, 295–314; W. R. Scott, *Adam Smith as Student and Professor* (Glasgow, 1937), pp. 34–35, 64; Norman Kemp Smith (ed.), *Hume's Dialogues concerning Natural Religion* (Oxford, 1935), pp. 110–21; Greig, *op. cit.*, II, 316–18, 334–36.

[24] There were blasphemy laws in the statutes (cf. "Natural History of Religion" in his *Essays*, II, 309–63).

In an imaginary apologia Epicurus argues that if the phenomena of nature exhibit such marks of intelligence and design that an author is inferred as a cause, this conclusion does not warrant any inferences about the nature of the Deity beyond what appears in the original effects observed. Any other attributes rest on sheer hypothesis. The principle of a "particular intelligent" cause is both "uncertain and useless," since nothing can be inferred from it beyond the data observed. The argument from analogy to human designs and purposes is faulty since the Deity, by definition, is so unique as to preclude analogy. Since causes can be inferred only from the constant conjunction of two species of objects, the notion of a first cause contradicts the very idea of causation.[25] The Philo of the *Dialogues* repeats some of these arguments. Cleanthes, the exponent of natural theology, advances the usual arguments for design, to which the skeptic replies that the adjustment of means to ends might as well be inherent in the nature of things or matter itself as be evidence of intelligent order. Further, he argues that causal inference from part of nature does not permit inference respecting the whole; that since knowledge is so incomplete any generalization about the whole of phenomena transcends experience; that the argument for a first cause involves an infinite regress; and that all known data are inadequate to establish any system of cosmogony. When Cleanthes argues that the preponderance of good over evil shows the benevolence of the Creator, Philo replies that the existence of evil in any degree proves that the Deity is either not almighty or not perfectly benevolent. Despite these arguments, Philo concedes that theistic assumptions make the universe intelligible and that there is some plausibility in the principle of design but that actual theologic beliefs rest on sentiment and fancy. The net result of the dialogues are the conclusions that there is a certain high degree of regularity in physical and human nature; that the "cause or causes of order in the universe probably bear some analogy to human intelligence"; and that, even if the conclusion of a divine authorship be accepted, it does not permit inferences about the nature of the world, other than those which would follow directly

[25] *Enquiry concerning Human Understanding*, Sec. XI, pp. 141–48.

from phenomena. Though natural theology may prove the existence of God, it sheds no light on the world, which can be understood only with the methods of science.[26]

Smith apparently accepted Hume's critical views of rationalism in morals and politics, though his positive theories differed in important respects. He may also have shared his theological views to a considerable degree.

II. ADAM SMITH AND THE METHOD OF SCIENCE

Adam Smith's methodology was essentially empirical,[27] deriving its inspiration from Newton and Hume,[28] in contrast to the rationalistic method of the natural-law school of thought. Unfortunately, Smith nowhere in his writings explicitly formulated his own method of investigation in ethics and economics. His major works proceeded at once to subject matter, and his ideas of

[26] The critics do not agree as to which of the characters represented Hume's views. N. K. Smith (*op. cit.*, pp. 73–96) after careful analysis concludes that Philo stated Hume's position. Laing (*loc. cit.*) holds the opposite opinion. The writer concurs with Smith (cf. Hume's letter to Elliot in Greig, *op. cit.*, pp. 153–57). Toward the end, where Philo makes his concessions, the argument is quite weak. This may be part of what Hume called his "artful" writing. As early as 1757 Adam Smith apparently had advised Hume to be more prudent after reading the manuscript of the "Natural History of Religion," so that it seems most likely that he had also read the *Dialogues* (cf. Greig, *op. cit.*, I, 245).

[27] See above, p. 487. It may be objected that the terms "empiricism" and "rationalism" are inappropriate in discussing eighteenth-century writers, who themselves did not use the terms in this precise sense. This objection does not seem valid if the "rationalistic" elements of theories or arguments can be distinguished from the "empirical." The distinction here made came into use in the sense above defined some time in the early nineteenth century, though Bacon (1626) had used the words in approximately the modern sense (cf. *Oxford Dictionary*, *s.v.* "rationalist"; V. Cousin, *Cours de l'histoire de la philosophie* [Paris, 1829], I, 445). The British empiricists, e.g., Locke and Hume, contrasted their own method of reasoning with that of the Cartesians and other "rationalists." The immediate followers of Newton were quite explicit in rejecting the a priori method and compared Descartes, Spinoza, and Leibnitz unfavorably with their master, e.g., Roger Cotes in the Preface of his (2d) edition of Newton's *Principia* (1713); Henry Pemberton, *A View of Sir Isaac Newton's Philosophy* (London, 1728), pp. 2–5; Colin Maclaurin, *An Account of Sir Isaac Newton's Philosophical Discoveries* (London, 1748), pp. 14–19, 64 ff., 93–95.

[28] Hume regarded his own work as an application of the Newtonian method to the problems of epistemology and morals. His first work appeared with the title *Treatise on Human Nature: Being an Attempt To Introduce the Experimental Method of Reasoning into Moral Subjects* (1739).

method can be inferred only from incidental remarks and from the arguments of some minor, posthumously published, essays.[29]

Smith, somewhat like the later positivists, had little respect for the "cobweb science" of metaphysics, which had produced "nothing but subtleties and sophisms."[30] He neglected to state explicitly his own metaphysical assumptions, but he was no mere pragmatist. He believed that ethics and economics could be studied by scientific methods, that their laws were to be discovered by induction from sense data. He denies the possibility of a priori knowledge and refers to the "fallacious experiment" of Socrates and Plato, who tried to obtain knowledge by dialectic.[31] Sensation alone can be the source of knowledge, and complex sensations "are felt as simple and uncompounded sensations."[32] Experience provides the basis for causal connection, which may be established only through repeated observation of similar events. Likewise, "the general maxims of morality are formed, like all other general maxims, from experience and induction."[33] Smith's epistemology had many evident points of resemblance to Hume's, but, since he did not state his position fully, it is difficult to say how close the agreement was.

From a methodological standpoint the best evidence of Smith's

[29] *Essays on Philosophical Subjects* (1795), reprinted in *The Works of Adam Smith, LL.D.* (London, 1811–12), Vol. V.

[30] *Wealth of Nations*, V, i, Part III, art. ii (Cannan, II, 258). In a letter introducing an author to his publisher, Cadell (May 7, 1786), Smith has an interesting comment on this view. He says: "He has a work upon moral Philosophy which, tho' he and I differ a little as David Hume and I used to do, I expect will do him very great honour. It is as free from metaphysics as is possible for any work on that subject to be. Its fault, in my opinion, is that it is too free of them . . . ." (Scott, *Adam Smith*, p. 299).

[31] "History of Ancient Logics and Metaphysics," *Works*, V, 231.

[32] "Of the External Senses," *ibid.*, pp. 333–99. It should be noted that this not profound essay is devoted to the psychology of sensation rather than to epistemology.

[33] *Theory of Moral Sentiments*, VIII, iii (*Works*, I, 567). Except where otherwise noted the references to the *Moral Sentiments* are to the edition in the *Works*, a reprint of the sixth edition, the last from Smith's own hand. For convenience of reference to numerous subsequent editions, the "parts" are indicated by capital Roman numerals and the sections of the parts by lower-case Roman numbers. Some of the parts are divided into chapters without sections.

position is offered by the posthumous essay on "The Principles Which Lead and Direct Philosophical Enquiries, Illustrated by the History of Astronomy"[34] and similarly entitled fragments on ancient physics and ancient logic and metaphysics. These essays were apparently intended to form part of a history of scientific method. They are critical of metaphysics and of a priori methods in science and try to show that the experimental method of Newton was the true path, though Smith showed how Newton's predecessors had made valuable empirical contributions. Thus the process of investigation was from un-co-ordinated generalizations about a limited class of phenomena to more inclusive theories, from the more particular to the more general. The error of the pre-Newtonians lay in their hasty generalization and their tendency to substitute metaphysical notions for the inferences that could have been made from the data. Smith's discussion of the earlier astronomers is almost a critique in terms of the Newtonian "Rules of Reasoning in Philosophy."[35] At each stage of

[34] *Works*, V, 54–190. From internal evidence this essay appears to have been written some time before 1758, though the original draft was revised later, and at Smith's death there were notes for another revision. The author was evidently quite partial to this "fragment of an intended juvenile work." In 1773 he directed Hume to publish it in the event of his death, and in 1790 he preserved it from destruction, along with the other methodological essays, when he ordered his friends to burn sixteen volumes of other manuscript. It is clear that these essays antedate the *Moral Sentiments*, but it is not evident whether they dated from the Oxford period, as might be suggested by Smith's word "juvenile," or from his Edinburgh or early Glasgow lectures. It may be surmised that Smith laid this original plan aside when he began the composition of his two great works. In his letter to Hume in 1773 he describes the essay as containing a history of astronomical systems to the time of Descartes (John Rae, *Life of Adam Smith*, pp. 262–63). Since the form of the essay as published included an elaborate treatment of Newton's system, it seems likely that at least the latter part was written after 1773. Consequently, its views would seem to be those of Smith at his maturity.

[35] Sir Isaac Newton, *Mathematical Principles of Natural Philosophy*, trans. Andrew Motte, ed. N. W. Chittenden (New York, 1846), Book III, pp. 384–85. Omitting Newton's comments, these rules are: "Rule I. We are to admit no more causes of natural things than such as are both true and sufficient to explain their appearances. Rule II. Therefore to the same natural effects, we must, as far as possible, assign the same causes. Rule III. The qualities of bodies, which admit neither intension nor remission of degrees, and which are found to belong to all bodies within the reach of our experiments, are to be esteemed the universal qualities of all bodies whatsoever. Rule IV. In experimental philosophy we are to look upon

investigation the conclusions are embodied in "systems," which are subject to correction or rejection according to the results of investigation and criticism. Says Smith:

> Systems in many respects resemble machines. A machine is a little system, created to perform, as well as to connect together, in reality, those different movements and effects which the artist has occasion for. A system is an imaginary machine invented to connect together in the fancy those different movements and effects which are already in reality performed. The machines that are first invented to perform any particular movement are always the most complex, and succeeding artists generally discover that, with fewer wheels, with fewer principles of motion, than had originally been employed, the same effects may be more easily produced. The first systems, in the same manner, are always the most complex, and a particular connecting chain, or principle, is generally thought necessary to unite every two seemingly disjointed appearances: but it often happens, that one great connecting principle is afterwards found to be sufficient to bind together all the disconnected phenomena that occur in a whole species of things.[36]

A system in this sense was a theory, based on one or more general propositions, from which all the known phenomena could be deduced or causally explained, though the major premises could be established only by inductive procedures. Smith's ideal was Newton's "System of the World," the synthetic portion of his physics and astronomy, in which the solar system was explained deductively with the gravitational law as the major premise.[37] Smith emphasized the importance of induction without showing precisely what constituted valid induction or without distinguishing carefully between the functions of deductive and inductive reasoning. By "induction" he meant, probably, a procedure

---

propositions collected by general induction from phaenomena as accurately or very nearly true, notwithstanding any hypothesis that may be imagined, till such time as other phaenomena occur, by which they may either be made more accurate, or liable to exceptions."

[36] *Works*, V, 116–17. John Rae seized upon this quotation as the basis for his criticism that Smith's economics was not an empirical science but a philosophic system, useful for didactic or propaganda purposes (see above, p. 489). Veblen used it for a similar purpose.

[37] Cf. "History of Astronomy," *Works*, V, 175–90. The Newtonian system is "the greatest discovery that ever was made by man, the discovery of an immense chain of most important and sublime truths, all closely connected together, by one capital fact, of the reality of which we have daily experience" (*ibid.*, pp. 189–90).

analogous to Newton's "experimentalism," which combined both methods, using the terms in the sense of, say, Mill's *Logic*. At least both Smith and Newton used both techniques.[38] The Newtonian method was what Jevons called "inverse deduction." Analysis consisted of a study of a given class of data, observations, or experiments as basis for the formulation of a tentative causal hypothesis, which, in turn, was to be tested by further observation and experiment and accepted or rejected according to agreement or disagreement with fact. A valid generalization might then be used to establish further and more general hypotheses, themselves to be tested in the same way. The final check on this procedure was to take the most general conclusion as a major premise and then to determine whether all the known relevant phenomena could be deduced from it, i.e., synthesis or system-building.[39] The famed Newtonian "hypotheses non fingo" did not imply that hypothesis was not a part of scientific method but only that hypotheses transcending experience were to be rejected.[40] In fact the *Principia* contains more formal mathematics than empirical data. As seen by the Newtonians (and also by Newton probably), the merit of the experimental method was its inference of causes from effects, as opposed to the rationalistic procedure.

[38] Newton and some of his followers sometimes speak of deducing principles from phenomena. Their quarrel with the Cartesians was not over deduction as such, but over the "rationalistic" method of deducing effects from assumed a priori causes, which could not be established from empirical data.

[39] Cf. Cotes, *loc. cit.;* Pemberton, *op. cit.*, pp. 5–15; Maclaurin, *op. cit.*, pp. 6–19, 90–93. Newton's methodological remarks were scattered, and his disciples stated his position more systematically. For a modern discussion of Newton's views see Edwin A. Burtt, *The Metaphysical Foundations of Modern Physics* (New York, 1925), pp. 202–23. It seems quite probable that Adam Smith knew these early commentaries on Newton. The catalogue of his library shows that he had Pemberton's edition (1726) of the *Principia*, but it does not indicate that he had the more popular work here cited. Bonar's catalogue lists Maclaurin's *Treatise on Fluxions* but not his study of Newton. Smith in his "History of Astronomy" refers to Maclaurin (*Works*, V, 161). From the context the reference was to his work on Newton or some other work on astronomy, and not to a text on the calculus. From the lists of subscribers prefixed to Pemberton's *View* and Maclaurin's *Account* it appears that Robert Simson, Smith's teacher, colleague, and friend, had both works. The names of several other friends (Lord Kames, Stewart, the merchant) appear as well.

[40] Newton used *fingo* not *utor*.

Results might be tentative; laws would be a succession of approximations; they might be incomplete, but they would rest on the solid ground of data and would not be conjectural inferences from uncertain premises.

The "History of Astronomy" illustrated the method of successive approximations, the opposition to metaphysics, and the validity of empirical methods. The same view is maintained in the other methodological fragments, though in a more negative way. Smith's opposition to nonempirical modes of reasoning extended even to a disparagement of formal logic.[41] Since it may safely be assumed that Smith did not hold to a logical dichotomy of *Naturwissenschaft* and *Geisteswissenschaft*,[42] the ethical and economic works might be expected to imitate the Newtonian method. The *Theory of Moral Sentiments* is an attempt to state valid generalizations about the ethical judgments made by mankind. Its purpose is not primarily normative, in the sense that the author tried to show what ought to be done, though he frequently lapsed into exhortation. Rather it tries to explain the causes of moral decisions, taken as data; it is a sort of sociology and psychology of value judgment.[43]

Smith holds that there is little disagreement among men as to what specific types of conduct are approved or disapproved, except, perhaps, on the part of those directly involved. With these judgments as data, he analyzes the common elements and subsequently combines them into a theory of general approbation and disapprobation. Finally, he discusses earlier theories of ethics

[41] The Glasgow course in logic as Smith taught it gave only a cursory treatment of formal logic; the major part of the course was rhetoric and belles-lettres (*cf.* Dugald Stewart's "Account of the Life and Writings of Adam Smith" in Smith's *Works*, V, 412, where he quotes from Professor John Millar, one of Smith's pupils).

[42] "Human society, when we contemplate it in a certain abstract and philosophical light, appears like a great, an immense machine, whose regular and harmonious movements produce a thousand agreeable effects" (*Mor. Sent.*, VIII, iii, p. 560).

[43] Thus he states explicitly: "Let it be considered too, that the present inquiry is not concerning a matter of right, if I may say so, but concerning a matter of fact. We are not at present examining upon what principles a perfect being would approve of the punishment of bad actions; but upon what principles so weak and imperfect a creature as man actually and in fact approves of it" (*ibid.*, II, i, p. 129 [1st ed., p. 167]).

in terms of their internal consistency and their consonance with the facts as he understood them. His argument is that the moralists of all schools are in substantial agreement on the data, i.e., the types of conduct regarded as moral; their disagreement is in the explanations given.[44] The earlier theories are regarded as defective for various reasons. Theories "which make virtue consist in propriety"[45] are defective in that "none of these systems either give, or even pretend to give, any precise or distinct measure by which this fitness or propriety of affection can be ascertained or judged of,"[46] that is, they lack precision. Systems based on prudence fail to explain many types of approved conduct, just as systems of benevolence cannot explain universal approval of certain types of self-interested behavior.[47] Mandeville's "licentious system" is sheer sophistry in that it confounds virtue and vice and in any event is wholly unempirical.[48] After thus demonstrating the unsatisfactory character of definitions of virtue, Smith analyzes theories of approbation, which, he concedes, are at least valid empirical generalizations. Simple egoistic theories[49] cannot explain social interests and benevolent acts, for the attempt to explain benevolence in terms of putative self-interest fails because individuals have sentiments of approval, or the contrary, about acts in the past which could not affect them or about events which could not conceivably occur to them.[50] Rationalist theories place undue emphasis on reason, which is merely instrumental and has the limited function of formulating general rules. But "it is altogether absurd and unintelligible to suppose that the first per-

[44] This agreement must be qualified in so far as the approval of conduct varies somewhat with time, place, and cultural development. Infanticide, though approved by the Greeks, would not be approved in modern times (*ibid.*, V, chap. ii).

[45] He names Plato, Aristotle, the Stoics, Clark, Woollaston, and Shaftesbury.

[46] *Mor. Sent.*, VII, ii, chap. i, p. 518.

[47] Epicurus, on the one hand, the Church Fathers, Cudworth, and Hutcheson, on the other, are cited.

[48] In the first five editions La Rochefoucauld was bracketed with Mandeville, but his name was struck out of the sixth. Holbach and Helvetius were not mentioned.

[49] He mentions Hobbes, Pufendorf, and Mandeville. The inclusion of Pufendorf in this category seems unwarranted.

[50] *Mor. Sent.*, VII, iii, p. 563.

ceptions of right and wrong can be derived from reason," for they are founded upon "immediate sense and feeling."[51] Smith objects to Hutcheson's "moral sense," which had a "peculiar power of perception," because there is no empirical evidence for the existence of such a sense. As an analytic device it is useless, for it cannot explain any sentiment which cannot be explained as well without resort to a "moral sense."

The adequacy or correctness of Smith's theory as an ethical system is not under discussion here. What is significant, however, is that his procedure was an application of the techniques of Newtonian experimentalism to the questions of morals. Experimentation was obviously ruled out by the nature of the subject matter, but the analysis, criticism, and formulation of conclusions was empirical. The adequacy of the observations may be questioned; it is doubtful that the high degree of uniformity of sentiments, which Smith postulated, actually occurs. Smith sometimes departs from the strictly descriptive-analytic method by resort to advice and exhortation.[52]

A detailed discussion of the method of the *Wealth of Nations* is scarcely necessary in this *Journal*. Even a superficial acquaintance with the work should be enough to dispose of the view that it was a series of abstract deductions from a single premise of self-interest. The assumption of egoistic motivation in economic life is obvious enough, but Smith's work is not deductive in the sense that the term could be applied to, say, the major works of Ricardo and Senior. The bulk of Smith's text consists of descriptive, historical, and statistical data, with a few inferences from "conjectural history."[53] There are some deductions from definition and arguments supported only by common knowledge or casual ob-

[51] *Ibid.*, p. 568.

[52] The *Moral Sentiments* was a redaction of the first part of the Glasgow lectures, which were intended to form the character, as well as train the minds, of undergraduates, many of whom were preparing for the service of the kirk and the bar (cf. Scott, *Francis Hutcheson*, pp. 64–68). This may possibly account for the rhetorical style of the *Moral Sentiments* when compared with the *Wealth of Nations*, written years after Smith had stopped teaching.

[53] The phrase is Dugald Stewart's in his "Account" (*op. cit.*, p. 450); illustrations are the deer and beaver problem and the economy of "the original state of things."

servation, which give parts of the work an abstract tone. But Smith had argued that valid generalizations could be reached only by induction from observation, and he tried to apply this technique. Often his data were not explicitly stated, and, perhaps, they were inadequate to support some of his conclusions. He depended upon casual observation in such matters as wage differentials, costs of production, and the pharmacist's high markup, as indeed was unavoidable considering the available data. In other instances he piled up facts to prove his point, e.g., the long digression on the value of silver, the statistics of wheat prices, and changes in wage rates and profits. In terms of present-day methods his statistical technique was primitive, and he took too few variables into account. The important point, methodologically, is that he used such facts as he had; he believed that his conclusions were valid inferences from his data; he attempted to check his theories by factual observation. He was scientific for his day.

After establishing, to his own satisfaction at least, a large number of theoretical propositions about the statics and dynamics of production and distribution in the first two books, he analyzed the economic policies of Europe and the "systems" of political economy in the third and fourth books. As in his *Moral Sentiments*, he criticizes the earlier systems in terms of their consistency, the validity of their theoretical inferences, and their appropriateness as means of attaining the end postulated, the maximization of per capita real income.[54] This third criterion involved definite normative assumptions, which may be questioned but are unavoidable if economic policy is to be discussed.

Brief note should also be taken of Adam Smith's minor essays. His studies of aesthetics and linguistics[55] were also intended to be empirical investigations, though the essay on languages represents "conjectural history" at its worst, with classic Latin taken as a type of primitive language. Some idea of the probable content

[54] See below, p. 516.

[55] "Of the Imitative Arts," *Works*, V, 243–318; "Of Certain English and Italian Verses," *ibid.*, pp. 321–30; "Considerations concerning the First Formation of Languages," *ibid.*, pp. 1–48. The "Considerations" appeared first as an appendix to the third edition of the *Moral Sentiments* (1767); the others were posthumous.

of the projected work on jurisprudence may be obtained from the Glasgow lectures of 1763.[56] These lectures compare the principles of public and private law in England and Scotland with Roman law and Continental jurisprudence, and in the latter part they cover the same ground as the fourth and fifth books of the *Wealth of Nations*. The legal sections do not involve many abstract generalizations. As they were reported, they consisted very largely of legal data, with some references to the theories advanced in the *Moral Sentiments* and some criticisms of the doctrine of natural law and natural rights. As reported, Smith's jurisprudence was decidedly empiristic.[57]

The foregoing discussion of Adam Smith's method has been predicated on the assumption that he believed that the experimental method of Newton, which he extolled in a minor essay, could be applied to the moral sciences, with, perhaps, some modifications in technique due to the subject matter and the impossibility of controlled experiment but without change in epistemological position. Conclusions would be valid only in terms of observation and reasoning upon data, sometimes taking the form of mental experiment.[58] The procedure might be quite abstract, but "fact" rather than "reason" or "the nature of things" would be the theoretical point of departure. The *Geisteswissenschaften* presented a special difficulty apart from the problems of inadequate observation and experimentation. They could not easily be confined to the descriptive-analytic since they touched upon the normative at many points. The analysis of economics and ethics might be empirical and positivistic, but the synthesis could not avoid normative implications, especially considering Smith's definition of the scope of political economy.[59] One of the achievements of Adam Smith was to apply the experimental method to the problems of economics and ethics and so to formulate valid

[56] Edwin Cannan (ed.), *Lectures on Justice, Police, Revenue and Arms* (Oxford, 1896).

[57] It is possible that the text did not fully report the lecturer's conclusions, and perhaps not accurately. What professor would wish to be preserved to posterity by a student's lecture notes?

[58] Hume regarded the mental experiment as a proper empirical device.

[59] See below, p. 516.

"systems." His weakness was, perhaps, the belief that the data observed would yield valid normative ideals.

III. MOTIVATIONS AND MORALS

An examination of Adam Smith's ideas about human motivation seems indispensable to an analysis of his method and its relation to the doctrine of natural law, for, as will be shown, "Nature" appears mainly in his discussion of the basic instincts. The relation of the *Theory of Moral Sentiments* to the *Wealth of Nations* also hinges on this question, while the consistency or inconsistency of the two books has an important bearing on his method of investigation. Some of the commentators have construed the works as mutually consistent and complementary. Others have seen definite conflicts in their psychologic, ethical, or metaphysical theories. No logical difficulty is presented in scientific investigations if contrary assumptions or hypotheses are used in tentatively unrelated problems. If, however, generalizations from one set of data are to be combined with inferences from other sets as part of a larger synthesis, contrariety of postulates implies ambiguity in the broader conclusions, while contradiction of postulates makes valid generalization impossible, at least within the framework of non-Hegelian logic.

Since Smith was above all a system builder, these arguments of the critics must be examined, though some may be dismissed briefly. H. T. Buckle, in a passage often cited, holds that both works were essentially deductive, the one starting from the principle of sympathy, the other from self-interest.[60] If this were the case, the charge of inconsistency would not, of itself, be important, though it might cast doubt on the finality of Smith's conclusions. The reasons for not regarding either work as essentially deductive have already been given. Others have held that the ethical theory was written under the influence of Shaftesbury and Hutcheson and that the economic treatise was more influenced by Hobbes and Mandeville. Smith, however, was thoroughly familiar with these writers in 1759, when he criticized them adversely, and he did not withdraw his objections. Whether or not he changed his

[60] *History of Civilization in England* (New York, 1890), Vol. II, chap. vi, pp. 340–57.

views is more debatable. The influence of French materialism and physiocracy has been given less emphasis in recent years as a formative influence on Smith's thought, though his theory of distribution shows signs of physiocratic influence.[61] One writer goes as far as to say that the intervening period of seventeen years enabled him to read and appropriate a new body of literature.[62] In any case he may have been inconsistent without being aware of the fact. The rather extensive revision of the text of the sixth edition,[63] published shortly before the author's death in 1790, would indicate that his intellect was not enfeebled and that this edition still represented his views, so that any disagreement with the *Wealth of Nations* cannot be passed over as mere oversight. The Preface of the last edition of the *Moral Sentiments* explains that the *Wealth of Nations* is to be regarded as partial fulfilment of the promise to publish a work on justice. It may be inferred that Smith himself regarded the works as complementary or as parts of a larger whole to be completed by a study of jurisprudence and political theory.[64]

Adam Smith's psychological views are stated only incidentally

[61] The discovery of the *Lectures* of 1763 showed that Smith had held the doctrine of laisser faire before his French journey, a view which Dugald Stewart had maintained on other evidence. It was thought that the natural order of the physiocrats greatly influenced Smith's thought. Most of the critics, however, find more of the natural-order doctrine in the *Moral Sentiments* than in the *Wealth of Nations*, but the former work preceded the exposition of the physiocratic order by several years. It will be shown below that the Smithian conception of natural processes was quite different from the physiocratic.

[62] Skarżyński, *op. cit.*

[63] The first five editions of the *Moral Sentiments* (1759, 1761, 1767, 1774, and 1781) were not materially changed by the author. The second edition changed the titles and numbering of the parts and sections and added eighteen pages and a footnote (p. 76) in answer to an objection by Hume. Otherwise the text is the same except for the correction of errata and a few verbal changes. The second to fifth editions are identical, page by page, except for changes in spelling and spacing due to typesetting. The third edition added the dissertation on languages, and the fourth added a subtitle, "The Theory of Moral Sentiments, or an Essay towards an Analysis of the Principles by which Men Naturally Judge concerning the Conduct and Character, First of Their Neighbours, and Afterwards of Themselves." The forms of the title-pages, publishers' names, and colophons also varied.

[64] It seems likely that Smith had written part of this third treatise by 1790. The manuscript may have been among the papers he ordered destroyed just before his death. The *Lectures* give some indication of the probable contents.

to other problems. While knowledge of the external world can be obtained only through the senses[65] and individual differences are attributed largely to experience and education,[66] the individual does not start as a *tabula rasa* but is equipped with certain instincts and passions necessary for survival.[67] The stimulus to action is not reason—which, to Smith as to Hume, is a passive comparison of ideas—but various emotions arising from physical needs or imagination. In the former group Smith includes hunger, sex, and physical pain, although imagination plays a part in the more complex manifestations of these drives. The passions controlling ethical and economic behavior are mostly the product of experience and imagination. In the *Moral Sentiments* they are divided into selfish, social, and unsocial passions. The unsocial passions—anger, hatred, and resentment—"are regarded as necessary parts of the character of human nature,"[68] quite as much as the social—"generosity, humanity, kindness, compassion, mutual friendship and esteem, all the social and benevolent affections."[69] Although physical passions might be considered as selfish, the chapter on the selfish passions is concerned with "grief and joy, when conceived upon account of our own private good or bad fortune."[70] Included are the desire for wealth, prestige, fame, and position. Smith holds that selfish passions are stronger and more direct than social sentiments, which are developed only by experience.[71]

[65] The essay on the external senses does not treat of the emotions, but a hint of the later theory is given in the passage: "Nature, it may be said, never bestows upon any animal any faculty which is either not necessary or useful" (*Works*, V, 389).

[66] "The difference between the most dissimilar characters, between a philosopher and a common street porter, for example, seems to arise not so much from nature, as from habit, custom and education. When they came into the world, and for the first six or eight years of their existence, they were, perhaps, very much alike, and neither their parents nor playfellows could perceive any remarkable difference" (*W. of N.*, I, ii [Cannan, I, 17]).

[67] "Of the External Senses," *Works*, V, 389–99.

[68] *Mor. Sent.*, I, ii, chap. iii (*Works*, I, 51).

[69] *Ibid.*, chap. iv, p. 59. [70] *Ibid.*, chap. v, p. 63.

[71] "Every man, as the Stoics used to say, is first and principally recommended to his own care; and every man is certainly in every respect, fitter and abler to take care of himself than of any other person" (*ibid.*, VII, ii, chap. i, p. 382). "Though it

The insistence upon the importance of egoistic motives would be an obvious consequence of Smith's individualistic psychology. His difficulty was not to account for selfishness but rather how to explain sentiments about matters not directly affecting individual interests, i.e., actions of others involving third parties, emotions aroused by the feelings of others, or even the sentiments occasioned by literature and remote history—in brief, how to account for the social and the unsocial passions. Smith, following Hume, bridges this gap by the psychological device of "sympathy" or "fellow-feeling." Sympathy is not an ethical principle but a name given to a complex psychological process whose elements are sensations of events occurring to others, imagination, and the spectator's own emotions and prior experience. Smith does not elaborate on this "mechanism"[72] but describes it simply.

> As we have no immediate experience of what other men feel, we can form no idea of the manner in which they are affected, but by conceiving what we ourselves should feel in the like situation. . . . . Whatever is the passion which arises from any object in the person principally concerned, an analogous emotion springs up at the thought of his situation in the breast of every attentive spectator.[73]

In this way it is possible to explain the existence of benevolent sentiments, that "how selfish soever man may be supposed, there are some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it." On this basis Smith could develop an ethical theory taking account of nonegoistic behavior. He believed that the fundamental social and unsocial, as well as the egoistic, passions were common to all normal men but that the sentiments arising from these passions differed somewhat with time, place, and circumstance. Thus changes in culture would affect the expression of these passions;

---

may be true, therefore, that every individual in his own breast, naturally prefers himself to all mankind, yet he dares not look mankind in the face, and avow that he acts according to this principle" (*ibid.*, II, ii, chap. ii, p. 140).

[72] Perhaps because he regarded it as obvious or already familiar to his readers from Hume's work (cf. Ludovico Limentani, *La Morale della simpatia* [Genoa, 1914], p. 43).

[73] *Mor. Sent.*, I, i, chap. i (*Works*, I, 2, 4).

sentiments in part would be directed to different objects and actions; types of conduct approved at one time might meet with disapproval at another or might vary at the same time at different places or among social classes. Moreover, he holds that these passions were implanted in man, or made a permanent part of human nature by Nature, to enable man to live in society and fulfil her purpose.[74] Irrespective of their origin, however, the operation of these sentiments was to be determined by the observation of behavior.

An empirical theory of morals could not be dogmatically normative, nor could it start from an ideal definition of virtue. Smith's theory[75] had its starting-point in the fact that men do approve and disapprove of the acts of their fellows and that by sympathy they share the sentiments of others and so become aware of social approbation or disapprobation of their own conduct.[76] There is thus a mutual interaction of the sentiments of the participators and spectators. With some minor qualifications, the essence of Smith's theory is that those actions are approved (or regarded as moral) which a disinterested spectator feels are appropriate in kind and degree to the passions of the parties immediately concerned. The spectators share the actors' sentiments, but in a lesser degree, so that the moral rule is one of *aurea mediocritas*.[77] Thus, if an action arises from a feeling of resentment or revenge, only moderate action will be approved, since the spectator sympathizes both with the actor and with the victim of the action. Where the action is due to social passions, there is no conflict of sentiment and full approval is given to it; gratitude and benevolence do not so easily appear excessive as anger or revenge. It is this difference and its implications which probably account for the view, often held, that Smith's ethical theory was essentially altruistic. The sentiments of spectators with regard to selfishly

[74] *Mor. Sent.* (*Works*, I, 129, 145, 182, 281).

[75] For analyses of his ethics see Limentani, *op. cit.*, and Glenn R. Morrow, *The Ethical and Economic Theories of Adam Smith* (New York, 1928). Many other works discuss the subject, but in less systematic fashion.

[76] *Mor. Sent.* (*Works*, I, pp. 190–205).

[77] *Ibid.*, I, ii, Introd. (*Works*, p. 36).

motivated conduct are intermediate. Speaking of grief and joy, he says:

> Even when excessive, they are never so disagreeable as excessive resentment, because no opposite sympathy can ever interest us against them; and when most suitable to their objects, they are never so agreeable as impartial humanity and just benevolence: because no double sympathy can ever interest us for them.[78]

This passage may have some implication of a harmony of interest, in that one man's joy at his own good fortune does not imply another's grief at his misfortune produced by the same event. Such a conflict would not occur in all instances, however, unless a perpetual Hobbesian state of nature be assumed. In other places Smith recognizes that action from selfish motives may involve a conflict, so that the sympathy of the spectators extends to both parties and so demands moderation, embodied in the rules of justice, fair play, rules of the game, and canons of good form.

> In the race for wealth, and honours, and preferments, he may run as hard as he can, and strain every nerve and every muscle, in order to outstrip all his competitors. But if he should justle, or throw down any of them, the indulgence of the spectators is entirely at an end. It is a violation of fair play, which they cannot admit of.[79]

The impartial spectator thus gives full approval to all benevolent actions, but he experiences a conflict of sentiments, always in actions due to the unsocial passions and sometimes when due to selfish motives, where there is a conflict of feelings on the part of those directly concerned. Individuals, if guided entirely by their own emotions, would act in ways not meeting general approval. But Nature has not "abandoned us entirely to the delusions of self-love. Our continual observations upon the conduct of others, insensibly lead us to form to ourselves certain general rules concerning what is fit and proper either to be done or to be avoided."[80] The individual feels bound by these commonly approved standards and regards them as the commands of the Deity.[81]

Rules of morality have a double function, to provide individuals with criteria for the judgment of the conduct of others and to

[78] *Ibid.*, chap. v., p. 63.
[79] *Ibid.*, II, ii, chap. ii, p. 141.
[80] *Ibid.*, III, chap. iv, pp. 269–70.
[81] *Ibid.*, chap. v.

provide themselves with standards for their own actions. Smith's theory tries to discover these rules by formulating the attitudes of the impartial spectator, a character whose role has been variously interpreted. Observers of any action in which they are not concerned sympathize with the parties to the action, and the attitudes of the spectators are regarded by Smith as moral rules. The impartial spectator might be regarded as a dialectical device for establishing some norm from which actual conduct could be studied. That is, the term might be understood, not as applying to any live person at some time, but as an abstract functional point of reference. It seems, however, preferable to interpret the concept *simpliciter*, for Smith uses the term in the plural as well as the singular; he refers to the past experience of the spectator and frequently substitutes an impersonal "we" or "mankind" for the impartial spectator.[82] Presumably a dialectical device would have no past history or plural. His argument is simply that the spectators view a situation with approval or disapproval and that in passing these judgments they are influenced by their past experiences with analogous situations and by the attitudes of one another. Furthermore, Smith believes that all the disinterested spectators will be in substantial agreement, since all normal men have the same passions. Hence the impartial spectator represents the common consensus of the attitudes of a group, and moral rules are conventional standards. Thus he says: "When these general rules, indeed, have been formed, when they are universally acknowledged and established, by the concurring sentiments of mankind, we frequently appeal to them. . . . ." That is, the rules of conduct are social, but the individual conscience feels bound by them and in doubtful circumstances appeals to the attitude of an imagined spectator, "by a regard to the sentiments of the supposed impartial spectator, of the great inmate of the breast, the great judge and arbiter of conduct."[83] Occasionally, however, the individual conscience asserts its superiority to the rules and the general opinion and justifies contrary action or feeling.[84] These

[82] *Ibid.*, pp. 65, 80, 590. [83] *Ibid.*, VI, Conclusion, p. 464 (cf. III, iv, p. 272).

[84] *Ibid.*, III, chap. ii, pp. 219–24. Since conscience is the immediate cause of action, Smith's ethics has been interpreted as a theory based on subjective conscience and free will (cf. August Oncken, *Adam Smith und Immanuel Kant* [Leipzig,

are exceptional occasions or exceptional men. By and large, men behave according to the accepted rules. These rules are not very precise, except the rules of justice which are definitely stated, while the other maxims of conduct admit of varied application.[85] Even the rules of justice vary somewhat with time, place, and cultural level, though less subject to merely conventional change than other aspects of morals.[86] That the rules are affected by conventional attitudes does not imply that they are arbitrary or without intrinsic merit, for they interpret the sentiments of mankind about the most essential human relations, and these sentiments have a natural foundation in the needs of society.

The alleged conflict between Adam Smith's major works may be examined more easily after this brief sketch of his ethical theory.[87] It has been argued that he entertained contrary notions of human motivation in the two works or that his ethical notions contradicted each other. It is a quite correct commonplace that the *Wealth of Nations* assumes that economic behavior is motivated by self-interest, though the author does not deny the existence of benevolent sentiments or their occasional influence on economic acts.[88] Smith merely minimizes the importance of non-

---

1877], esp. pp. 90–95, 104, 245). Another writer implies that Smith's "man within the breast" is the voice of God (cf. Albert Delatour, *Adam Smith, sa vie, ses travaux, ses doctrines* [Paris, 1886], p. 101).

[85] "The rules of justice may be compared to the rules of grammar; the rules of the other virtues, to the rules which critics lay down for the attainment of what is sublime and elegant in composition" (*Mor. Sent.*, III, chap. vi., p. 303). "The rules of justice are accurate in the highest degree, and admit of no exceptions or modifications, but such as may be ascertained as accurately as the rules themselves, and which generally, indeed flow from the very same principles with them" (*ibid.*, p. 301).

[86] Cf. *ibid.*, V, "Of the Influence of Custom and Fashion upon the Sentiments of Moral Approbation and Disapprobation."

[87] It may be noted that no attempt is made here to evaluate Smith's theory as a psychologic explanation of conduct or as a theory of ethics. The question of importance for this essay is the relation of his ethical theory to his methodology and his "naturalism."

[88] "But man has almost constant occasion for the help of his brethren, and it is in vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and show them that it is for their own advantage to do for him what he requires of them. . . . . It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but

selfish or noneconomic motives in economic life. This is exactly the view maintained in the *Moral Sentiments*,[89] where there is also some attempt to explain this egoistic psychology. Where, as rarely, economic matters are mentioned, the assumption is always that self-interest is the motive of action. Tradesmen are expected to try to make money, to practice economy and parsimony;[90] merchants carry on business in terms of utility, i.e., self-interest, and exchange services at an agreed valuation.[91] Moreover, the common sentiment of mankind approves self-seeking, so that the individual, who has an instinctive desire of approval, has a further incentive for acquisitive activity, even to obtain wealth beyond his wants.[92] The acquisitive urge is regarded as quite universal when Smith asks: "From whence, then, arises that emulation which runs through all the different ranks of men, and what are the advantages which we propose by that great purpose of human life which we call bettering our condition?" The *Moral Sentiments* does not differ in its view of human nature from the *Wealth of Nations*. It merely considers many other matters than the "uniform, constant, and uninterrupted effort of every man to better

---

from regard to their own interest. We address ourselves, not to their humanity, but to their self-love, and never talk to them of our necessities but of their advantages. Nobody but a beggar chuses to depend chiefly upon the benevolence of his fellow-citizens. Even a beggar does not depend on it entirely . . . ." (*W. of N.*, I, ii [Cannan, I, 16]).

[89] He advances the argument that the rich man, in hiring labor, has an eye to his own well-being but in fact so provides for the wants of his workers, "all of whom thus derive from his luxury and caprice, that share of the necessaries of life, which they would in vain have expected from his humanity or his justice" (*Mor. Sent.*, IV, chap. i, p. 318).

[90] *Ibid.*, III, chap. vi, pp. 297–98.

[91] *Ibid.*, II, ii, chap. iii, p. 146. "Even a tradesman is thought a poor-spirited fellow among his neighbours, who does not bestir himself to get what they call an extraordinary job or some uncommon advantage," as would be a gentleman "who did not exert himself to gain an estate" or a politician who neglected to campaign or a prince who was not anxious to gain or keep territory (p. 298).

[92] "It is because mankind are disposed to sympathize more entirely with our joy than with our sorrow, that we make parade of our riches and conceal our poverty . . . . nay, it is chiefly from this regard to the sentiments of mankind, that we pursue riches and avoid poverty" (*ibid.*, I, iii, chap. ii, pp. 80–81). (This may be the inspiration of Rae and Veblen.)

his condition."[93] In both works self-interested conduct is regarded as usual and beneficial to society. Not only does the ordinary business of life depend upon it, but acquisitiveness stimulates industry, invention, and science. The opinion that Smith in the *Moral Sentiments* regarded benevolence as the leading motive, or as the moral motive, rests on an erroneous identification of benevolence and sympathy. In point of fact, however, the psychological device of sympathy is used to explain the approval of egoistic as well as altruistic sentiments.

From the point of view of ethics there also is little or no conflict between Smith's essays, though different arguments are used, as might be expected in studies of such different character. The *Theory of Moral Sentiments* was a purely academic study, an attempt to discover a valid theory of morals by empirical methods. Smith, like other authors of ethical treatises, could not expect his work to have any practical effect beyond the incidental edification of his readers. The *Wealth of Nations* sought valid theoretical conclusions, but it also proposed to apply these conclusions to a radical reform of policy. Paradoxical as it may seem, the theory of ethics was less directly normative than the scientific work on economics. The moral theory was in the main descriptive; the economic theory neatly wove prescriptive elements into its descriptive-predictive fabric.

The ethical propositions of the *Wealth of Nations* are of two sorts: statements of the aims of society or of social policy and evaluations of means of attaining these ends. It seems clear that to Smith the ultimate objective of social policy was the maximization of per capita income.

> Political œconomy, considered as a branch of the science of a statesman or legislator, proposes two distinct objects: first, to provide a plentiful revenue or subsistence for the people, or more properly to enable them to provide such a revenue or subsistence for themselves; and secondly, to supply the state or commonwealth with a revenue sufficient for the public services. It proposes to enrich both the people and the sovereign.[94]

[93] *W. of N.*, II, iii (Cannan, I, 325). With slight variations this phrase is repeated elsewhere (Cannan, I, 328; II, 43, 172).

[94] *W. of N.*, IV, Introd. (Cannan, I, 395).

The argument of Book V shows that the income of the state depended on the size of the national real income. While Smith in places speaks of the aggregate national income as the end of social policy, the first statement of his objective measures welfare in terms of income per head.[95] Systems of political economy are judged in terms of this criterion, to which Smith sees only one limitation. Economic interests must sometimes be subordinated to military.[96]

Related to his general economic norm is his position with regard to the conflicting interests of economic classes. He prefers the more numerous to the less numerous groups as a matter of general policy; consumers take precedence over producers.

> Consumption is the sole end and purpose of all production; and the interest of the producer ought to be attended to, only so far as it may be necessary for promoting that of the consumer. The maxim is so perfectly self-evident, that it would be absurd to attempt to prove it. But in the mercantile system, the interest of the consumer is almost constantly sacrificed to that of the producer; and it seems to consider production, and not consumption, as the ultimate end and object of all industry and commerce.[97]

The principal reason for condemning monopoly is the injury to consumers,[98] but monopoly also is wasteful[99] and injurious to the interests of capitalists seeking advantageous investments.[100] The

[95] "According therefore, as this produce, or what is purchased with it, bears a greater or smaller proportion to the number of those who are to consume it, the nation will be better or worse supplied with all the necessaries and conveniencies for which it has occasion" (*ibid.*, Introd. [Cannan, I, 1]). The real wealth is equated to the annual produce of land and labor in a number of other places (Cannan, I, 237, 240, 417).

[96] "As defence, however, is of much more importance than opulence, the act of navigation is, perhaps, the wisest of all the commercial regulations of England" (*ibid.*, IV, ii [Cannan, I, 429]).

[97] *Ibid.*, IV, viii (Cannan, II, 159).

[98] "The price of monopoly is upon every occasion the highest which can be got" and "the highest which can be squeezed out of the buyers" (*ibid.*, I, vii [Cannan, I, 63]).

[99] "Monopoly, besides, is a great enemy to good management, which can never be universally established but in consequence of the free and universal competition which forces everybody to have recourse to it for the sake of self-defence" (*ibid.*, I, xi, chap. i [Cannan, I, 148]).

[100] *Ibid.*, V, i, Part III, art. 1 (Cannan, II, 245).

mercantile system is a series of monopolies for the benefit of a few merchants and to the detriment of consumers, other merchants, landlords, and laborers.[101] The interests of merchants are in frequent conflict with those of other economic classes.[102] Guild regulations occasion "a very important inequality in the whole of the advantages and disadvantages of the different employments of labour and stock,"[103] i.e., they benefit a small group at the expense of a larger. Combinations of employers, facilitated by law, keep wages low and so are injurious to workers.[104]

It is evident that in these instances Smith did not postulate a harmony of interests but rather emphasized their conflict. He condemned mercantilism and guild restrictions in part because they reduced the national dividend and in part because they were inimical to the welfare of the larger groups in society. There remained his own system as the one most conducive to well-being: national income would be maximized; the free play of competition would enable each individual to obtain the wealth to which his efforts entitled him; government would be impartial in the conflicts of economic interests.

> All systems either of preference or of restraint, therefore, being thus completely taken away, the obvious and simple system of natural liberty establishes itself of its own accord. Every man, as long as he does not violate the laws of justice, is left perfectly free to pursue his own interest his own way, and to bring both his industry and capital into competition with those of any other man or order of men.[105]

The chief exegetical issue in this passage is the meaning of the "laws of justice." Did Smith here mean the justice implied by the law of property, contract, and tort, or did he imply some ideal ethical justice? The *Wealth of Nations* is not explicit on the point. It defines justice by implication when it mentions the second "duty of the sovereign, that of protecting, as far as possible, every member of the society from the injustice or oppression of every other member of it."[106] Even the *Moral Sentiments* treated justice in only general terms, since Smith had expected to publish a

[101] *Ibid.*, IV, vii–viii (Cannan, II, 129, 159).

[102] *Ibid.*, I, ix (Cannan, I, 100); I, xi (Cannan, I, 249–50); IV, vii, Part II (Cannan, II, 112).

[103] *Ibid.*, I, x, Part II (Cannan, I, 131).

[104] *Ibid.*, I, viii (Cannan, I, 68).

[105] *Ibid.*, IV, ix (Cannan, II, 184).

[106] *Ibid.*, V, i, Part II (Cannan, II, 202).

treatise on jurisprudence. What he does say there indicates some possibility of conflict between the ethical and juridical concepts, though he argues that the law is an attempt to formulate the ethical rules. The rules of justice are enforcible by punitive sanctions and so can apply only to conduct arising from the selfish or the unsocial passions. Compulsory benevolence is a contradiction. The common opinion approves of selfish conduct, provided that the individual conforms to the accepted rules of fair play, that is, that he does not interfere with another's opportunity of attaining his selfish ends. The spectators sympathize with all the actors, but where there is a conflict they approve of only moderate action. This is at best an indefinite rule, but in practice certain definite types of conduct are accepted as fair play or are rejected as unwarranted injury, in the light of the experience and habits of society. The laws of justice do not prescribe the ideal conduct, they merely state an ethical minimum. "Mere justice is, upon most occasions, but a negative virtue, and only hinders us from hurting our neighbour."[107] Moreover, there is a cultural lag between the ethical standards set by social approval and the rules of justice administered by courts, and the ethical standard may be used to judge the legal.[108]

> Every system of positive law may be regarded as a more or less imperfect attempt towards a system of natural jurisprudence, or towards an enumeration of the particular rules of justice. . . . . Sometimes what is called the constitution of the state, that is, the interest of the government; sometimes the interest of particular orders of men who tyrannize the government, warp the positive laws of the country from what natural justice would prescribe. . . . . Systems of positive law, therefore, though they deserve the greatest authority, as the records of the sentiments of mankind in different ages and nations, yet can never be regarded as accurate systems of the rules of natural justice.[109]

It seems probable, then, that the laws of justice which limit individual conduct under the Smithian system are to be understood as legal requirements, even though the law itself could be criticized in terms of social ideals and policy. The *Moral Sentiments* looked upon ethical problems from the standpoint of the

[107] *Moral Sentiments*, II, ii, p. 137.

[108] Presumably this is why Smith condoned smuggling (*W. of N.* [Cannan, II, 381]) and the illegal export of wool in an earlier period (*Lectures*, p. 136).

[109] *Mor. Sent.* VII, iv, pp. 608–9.

individual. As a theory of individual ethics it did not directly formulate social ideals, except incidentally. "All constitutions of government, however, are valued only in proportion as they tend to promote the happiness of those who live under them."[110] Though he agreed with the utilitarians in the practical consequences, Smith based this judgment of social policy upon the sentiments of the spectators rather than upon direct considerations of utility. The correspondence was due to the sentiments happily implanted by Nature.[111]

There is thus no apparent inconsistency in the main ethical presuppositions of the two works of Adam Smith. The earlier one was concerned with individual behavior and only mentions social ethics incidentally. The later work assumes the same standard of individual conduct and, in addition, formulates more distinctly at least one aspect of the happiness of the people living under government, the greatest possible average per capita income. No doubt the economic was only one aspect of happiness to Smith, but it was essentially part of the same criterion applied in the early work. Since the spectators might be presumed to sympathize with all, when there is a conflict of interest, they might be inclined to favor the more numerous group. Smith does not say so distinctly, but this view would not be inconsistent with what he says about social policy and the interests of individuals. In both works he emphasized the greater importance of social than of individual welfare, but in the framework of his individualistic psychology and morals the social well-being could mean only the well-being of larger, as opposed to smaller, groups. In the *Wealth of Nations* the impartial spectator puts in no appearance, unless perhaps Smith cast himself in that role. Nor is the doctrine of sympathy mentioned directly. In this way Smith freed his economics from direct dependence upon his earlier ethical theory, certainly a prudent step from both scientific and practical points of view. But the ethical assumptions are essentially the same. There remains then the question of the metaphysical consistency of the two works and the possible dependence of one or both on certain propositions of natural theology.

[*To be continued*]

[110] *Ibid.*, IV, chap. i, p. 320. [111] *Ibid.*, VII, ii, pp. 534–35 (cf. p. 325).

NOTES ON THE THEORY OF DUOPOLY

GEORGE J. STIGLER
University of Minnesota

THE very magnitude of the literature on the theory of duopoly may be interpreted as indirect evidence of the unsatisfactory state of this theory. Duopoly seems to present one of those problems concerning which everything sensible that can be said doubtless already has been said, and yet no single solution commands general agreement. It is the purpose of the present notes, not to increase the number of theories of duopoly, but rather to reappraise certain theories which have already been advanced.

Duopoly will be defined, for present purposes, as the market situation in which there are two (or, more generally, few) independent producers who do not explicitly agree on a common policy with respect to output, price, advertising, wages, and all other variables subject to their control. From this definition it follows that duopoly is present as long as there is a single variable of policy concerning which the two duopolists do not have an explicit agreement. In most of the literature price and output are construed to be the only variables of policy, but this is an unnecessary restriction of the analysis.

Why study duopoly? For under normal conditions it is easily demonstrated that approximately the maximum gain to each duopolist is attained when the two do collaborate and set a near-monopoly price. The reply to this argument must necessarily be half-hearted: for once empirical evidence joins a priori considerations in suggesting that explicit agreement is a typical "solution" of duopoly relationships. As far as price policies are concerned, there are widespread indications that American duopolists evince a distaste for rivalry.

Nevertheless, the theoretical duopoly problem is important. As has already been suggested, there are many variables in a

firm's market policy, and few duopolists seem able to reach agreement with respect to all these variables. The steel industry is less unanimous on labor policy than on prices; the leading cigarette manufacturers seem to possess no common policy toward advertising. Moreover, in the case of small numbers of producers, personalities are definitely important—as they are not under competition. Henry Ford has frequently refused to "play the game" with other automobile manufacturers,[1] for personal reasons as well as because the game did not always promise maximum profits. In the case of few producers (e.g., ten), finally, the administrative difficulties involved in bringing about and maintaining agreement are often very great, especially if the firms are of about equal size. For these and other reasons the theoretical duopoly problem merits the attention that economists have lavished upon it.

The present essay contains two parts. Part I treats of duopolists producing a homogeneous product; Part II extends the analysis to nonprice elements of market policy such as advertising.

I

The dominant firm.—Before embarking on the classical problem of duopoly, it may be permissible to restate a case in which there is no doubt concerning the solution—that of the dominant firm (also known as partial monopoly). This situation has received very little attention in the Anglo-Saxon literature,[2] although there appear to be a considerable number of industries in which its conditions are approximately fulfilled. These conditions are two: (1) one firm sells such a large proportion of the commodity in question that the other (small) firms individually ignore any effect they may have on prices; and (2) this dominant firm behaves pas-

[1] E.g., his refusal to join the Selden patent pool and to accept the N.R.A. Automobile Code.

[2] The essentials of this theory were first advanced by Karl Forchheimer, "Theoretisches zum unvollständigen Monopole," *Schmoller's Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft*, XXXII (1908), 1–12. The graphical exposition in the text owes much to Professor Viner, who first employed the marginal curves in analyzing this case a decade ago in classes at the University of Chicago. The most extensive treatment in English is that of F. Zeuthen, *Problems of Monopoly* (London, 1930), pp. 17–23; cf. also A. J. Nichol, *Partial Monopoly and Price Leadership* (Philadelphia, 1930), esp. chap. ii.

sively, i.e., it sets the price and sells the remainder after the minor firms have sold all they wish at the ruling price.

The analysis will be presented graphically, on the basis of Figure 1. Output of the commodity is measured along OX, price along OY. The three basic curves, which are self-explanatory, are AR_t, the average revenue (demand) curve of the industry; MC_d, the marginal cost curve of the dominant firm; and MC_m, the sum of the marginal cost curves of the minor firms. The first step is the construction of the demand curve for the dominant firm. Since, by hypothesis, the demand curves of the minor firms appear horizontal and since under that condition profits are maximized when marginal cost equals price, MC_m is the supply curve of the minor firms. Hence, at any price OF, the minor firms will supply $FE = CD$. If CD is subtracted from the total quantity (FD) demanded at this price, the remainder of $ED = FC$ constitutes the demand for the dominant firm. As OF takes on all possible values, the demand curve of the dominant firm (AR_d) is described. To AR_d a marginal revenue curve is drawn; it is represented by MR_d. The output of the dominant firm is set where marginal revenue equals marginal cost—at OA. The price will be AC, and the minor firms will supply $FE = CD$ at this price.

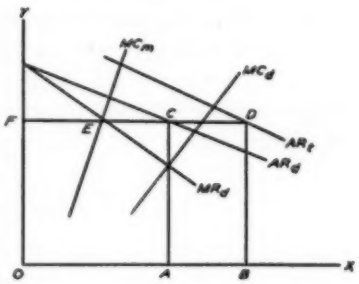

FIG. 1

This analysis may be restated symbolically in order to deduce a more general solution. Let $p = f(x) = f(x_1 + x_2)$ be the demand function for the industry, where x_1 and x_2 are the outputs of the dominant and minor firms respectively. Let $\phi(x_1)$ be the total cost function of the dominant firm and $\theta(p)$ the supply function of the minor firms. Then the net profit of the dominant firm is $x_1 p - \phi(x_1)$, which attains a maximum when

$$p + x_1 \frac{dp}{dx_1} - \phi'(x_1) = 0 .$$

From the demand function,

$$\frac{dp}{dx_1} = f'(x)\left[1 + \theta'(p)\frac{dp}{dx_1}\right],$$

so the equation becomes

$$p + x_1\left(\frac{f'(x)}{1 - f'(x)\theta'(p)}\right) = \phi'(x_1).$$

Finally, define the elasticity of demand, $\eta = p/[xf'(x)]$, and the elasticity of supply of the minor firms, $\epsilon = [p\theta'(p)]/x_2$, and let $k = x_1/x$ be the fraction of the total output supplied by the dominant firm. If these values are substituted into the equation, we secure

$$p\left(1 + \frac{k}{\eta - \epsilon(1-k)}\right) = \phi'(x_1). \tag{1}$$

A consideration of equation (1) suggests four generalizations:

1. The output of the dominant firm will decrease as k increases, if all other variables remain fixed.
2. The output of the dominant firm will increase as the elasticity of supply of the minor firms (ϵ) increases, if all other variables remain fixed.
3. The output of the dominant firm will increase as the elasticity of demand (η) increases in numerical value, if all other variables remain fixed.[3]
4. It follows by implication from equation (1) that there is no particular value of k for which this policy of pricing becomes profitable. The ratio k can be relatively small if ϵ is also small.

Classical duopoly.—The classical problem of duopoly is based on the following assumptions: a homogeneous product; two producers of approximately equal size; and full knowledge by each of the duopolists of his cost function and of the market demand function. These assumptions are followed throughout the remainder of this section.

Before entering on the detailed analysis, it may be well to consider a general question: How much knowledge should be attrib-

[3] These conclusions are based on the assumption that the marginal cost of the dominant firm increases with output, i.e., $\phi''(x_1) > 0$. In that case the rules are secured by differentiating equation (1) with respect to k, ϵ, and η.

uted to each duopolist, in addition to that specified above? Perfect knowledge, like most limiting concepts, leads to self-contradiction. Thus Chamberlin argues that, if the duopolists possess perfect knowledge, they will establish a monopoly price simply because it is most profitable—even without an Adam Smithian picnic.[4] But the argument is equally applicable if there are a million producers in the industry—perfect knowledge is really perfect! And, of course, the entrepreneurs in all other industries will also set monopoly prices, unless their knowledge is so perfect that they realize that universal monopoly will leave everyone worse off. We can escape most easily from such dialectics by granting our duopolists all pertinent knowledge except what their rivals will do. Since the rival's anticipated reaction is the crux of the duopoly problem, this assumption of quasi-perfect knowledge requires that we deal only with special cases—there can be no general theory of duopoly. It is a significant corollary of the present discussion, however, that differentials in knowledge will usually lead to differentials in the competitiveness of markets—in a reign of ignorance, knowledge confers monopoly.

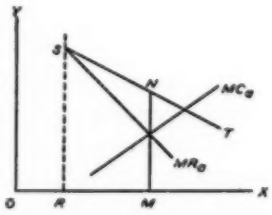

FIG. 2

The problem of duopoly may best be approached, following established precedent, by reproducing its first solution, that of Cournot.[5] His basic assumption was that each duopolist assumes that his rival's output can be treated as independent of his own. A unique solution then follows easily. Thus, in Figure 2 if OR is duopolist B's output, A will treat the remainder of the market as his own. Taking R as the origin, A will equate his marginal revenue, MR_a (derived from ST), to his marginal cost, MC_a, so he will set a price of MN and an output of RM. B will then proceed to take RM as the constant output of A and proceed similarly to

[4] *The Theory of Monopolistic Competition* (3d ed.; Cambridge, 1938), p. 47.

[5] *Researches into the Mathematical Principles of the Theory of Wealth* (New York, 1929), chap. vii; for a comprehensive survey of the literature of duopoly cf. H. von Stackelberg, *Marktform und Gleichgewicht* (Vienna, 1934), chap. v.

readjust his output. Eventually, these reactions will usually lead to an equilibrium position.

For purposes of comparison with later cases, it may be worth setting up a numerical illustration. Let A's total cost $= x_1^2/200 + 9x_1 + 3000$, B's total cost $= x_2^2/200 + 8x_2 + 3500$, and price $= 85 - x/20$, where x_1 and x_2 are the outputs of A and B, respectively, and let π_a and π_b be their profits. Then the Cournot solution[6] is

$$x_1 = 470 \qquad \pi_a = \$9{,}150$$
$$p = \$37.20$$
$$x_2 = 486 \qquad \pi_b = \$9{,}510$$

The Cournot solution rests on two additional assumptions which deserve explicit mention: (1) New customers (or the increased quantities taken by old customers) come into the market at least as quickly as the trade of old customers can be shifted, when the price is lowered. If this were not true, the reduction in, say, B's price would attract customers from A, thus violating immediately the assumption that A's output could be treated as a constant.[7] (2) Either the duopolists come immediately to the

[6] From these definitions it follows that

$$\pi_a = x_1\left(85 - \frac{x_1 + x_2}{20}\right) - \frac{x_1^2}{200} - 9x_1 - 3000,$$

$$\pi_b = x_2\left(85 - \frac{x_1 + x_2}{20}\right) - \frac{x_2^2}{200} - 8x_2 - 3500.$$

For π_a to attain a maximum (recalling that Cournot assumes $dx_2/dx_1 = 0$),

$$\frac{d\pi_a}{dx_1} = 76 - \frac{11}{100}x_1 - \frac{x_2}{20} = 0,$$

or

$$x_1 = 691 - \tfrac{8}{11}x_2.$$

Similarly,

$$x_2 = 700 - \tfrac{8}{11}x_1.$$

These are the reaction functions of A and B, respectively, and their simultaneous solution yields the values in the text.

[7] For a detailed consideration of the situation arising when this assumption fails cf. F. Zeuthen, *op. cit.*, pp. 41 ff.; A. J. Nichol, "Edgeworth's Theory of Duopoly Price," *Economic Journal*, XLV (1935), 51–66.

equilibrium price and outputs, or during the course of their movements to equilibrium their anticipations concerning rival reactions do not change.

Cournot and most of his followers have accepted this last condition, i.e., even if B's output changes fifty times in the course of movement to equilibrium, A will continue to treat it as independent of his own output each of the fifty times he (A) changes his output. Similarly, Bertrand, in offering an alternative theory of duopoly,[8] postulated that A would assume that B's price was independent of A's price—even if B's price were cut a hundred times in retaliation. In both cases a degree of stupidity is gratuitously attributed to duopolists that surely inhibits any rational treatment of the duopoly problem.

It should be evident, in fact, that a fundamental distinction must be drawn between anticipated rival reactions which prove to be correct and those which prove to be incorrect. The former anticipations will be retained as the basis for a duopolist's future price-and-output policies; the latter will almost inevitably be revised in the light of what the rival actually did do.

But the revisions of incorrect anticipations are not unique. Suppose (following Bertrand) that A reduces his price from $10 to $9, on the assumption that B will leave his price at $10, but that B actually cuts his price to $9. The following are only a few of the revisions that A may make of his anticipations regarding B's future policy: (1) B will match any price cut made by A, but not price increases; (2) B will match any price cut or increase made by A; (3) B will undercut A's future price cuts, to teach A the futility of price competition; (4) B has made his final price cut; (5) B will take any price in order to hold his regular customers or his regular "share of the trade"; and (6) B's price of $9 will soon be cut further. Many more interpretations are open, and it should require no argument that on the present general plane of analysis we have no information suitable to determine unique revisions of anticipations of a rival's policy.

It may rightfully be objected that if the revisions of anticipations are not unique, neither are the original anticipations—both

[8] *Journal des savants*, 1883, p. 503.

must be the product of experience. This is indubitably correct, and, if the validity of retaining erroneous anticipations had received more critical attention, there would doubtless be a considerable literature on revisions. The present essay will not deal with revisions because of space limitations, but it is not intended to imply that this problem is of less theoretical interest than that of correct anticipations.[9]

If the foregoing argument be accepted, it is not, in general, sufficient to possess merely the initial anticipations of each duopolist concerning his rival's reactions; data must also be provided to determine revisions of these anticipations. Duopoly theory can, in fact, deal with only two types of duopoly, on the basis of initial anticipations: (1) those in which anticipations prove to be correct[10] and (2) those in which equilibrium is established immediately and permanently (in the light of any particular set of data). These two types of duopoly are not identical. Correct anticipations need not lead immediately to equilibrium; there will generally be an intervening period in which their correctness is discovered or verified. On the other hand, cases will be presented below in which an immediate and permanent equilibrium is established, although one duopolist possesses incorrect anticipations.

Let us consider first anticipations which prove to be correct, and which therefore continue unchanged during the process of movement to equilibrium. Several such sets of anticipations are considered in some detail.

(i) The first set of anticipations that would be correct and mutually compatible (this latter condition is not redundant; see below) would arise if each duopolist assumed that his rival would match

[9] The theory of anticipations might profitably be extended to deal with an array of possible reactions of a rival, with a probability assigned to each possible reaction, as Professor G. Tintner has suggested to me. Such a procedure would include the present discussion as a special case in which a probability of 1 is assigned to one anticipated reaction of the rival.

[10] This means that Frisch's "conjectural variations" lose all usefulness in determining duopoly price as soon as they prove to be incompatible; they will be retained only if $dx_1/dx_2 = 1/(dx_2/dx_1)$ (cf. J. R. Hicks, "The Theory of Monopoly," *Econometrica*, III [1935], 13 ff.) The only place in the literature where I have been able to find any real attention to correct anticipations is W. Leontieff, "Stackelberg on Monopolistic Competition," *Journal of Political Economy*, XLIV (1936), 554–59.

any price cut. If the costs of the two duopolists are identical, this set of anticipations leads to a monopoly price (i.e., the price which would rule if A and B combined), as should be fairly evident. For the anticipation in effect splits the market into two equal parts, and the "private" demand curve of each duopolist is half of the total demand because customers will pair with A and B at random (with a homogeneous product).

Assume that both of the duopolists have the marginal cost function of A, i.e., marginal cost $= (x/100) + 9$. If they combine, the marginal cost of the combination $= (x/200) + 9$. Marginal revenue of the combination will be

$$\frac{d\left\{x\left[85 - \frac{x}{20}\right]\right\}}{dx} = 85 - \frac{x}{10},$$

and, if this is equated to marginal cost, output is determined to be 724 and price \$48.80. If, instead, A assumes that B will match any price cut, so total sales will be shared equally, then A's marginal revenue is

$$\frac{d\left\{x_1\left[85 - \frac{x_1 + x_2}{20}\right]\right\}}{dx_1} = 85 - \frac{x_1}{5},$$

where $x_1 = x_2$. If this marginal revenue be equated to A's marginal cost, the same solution is secured: $x_1 = x_2 = 362$; $p =$ \$48.80.

If B's marginal costs are lower than A's, as in our numerical example, B will set a price lower than that which maximizes A's profits. Thus, it was just shown that A would set a price of \$48.80 with an output of 362, where his marginal cost (\$12.62) equaled his marginal revenue. But B's marginal cost is \$11.62 for an output of 362, so he will reduce the price to \$48.30, where A and B will each sell 367 units.[11] A is compelled to accept this out-

[11] Secured by the same method that was used to determine A's output, except that now B's marginal cost is equated to marginal revenue.

put, or his profits would be reduced even further, as long as the price exceeds his marginal costs.[12]

The present set of anticipations, in which each rival expects that any price cut will be matched, yields a solution dependent on the price ruling at the outset of the analysis. If the beginning price is below the equilibrium level, the final price must be below also. This dependence on the initial point could be eliminated by adding the anticipation that A's increases of prices will also be matched by B. It may be argued, of course, that this additional anticipation reveals explicit agreement, for B's immediate profits would be larger if he failed to follow A's price increase. The question really turns on B's foresight: obviously, if he does not increase his price, A must restore his price to its former level, so B's gains will be temporary if he retains his lower price, whereas they would be permanent if he matched the increased price of A.[13]

(ii) A second case of correct anticipations arises when each duopolist assumes that his rival will insist on maintaining his "share of the market." If A and B are sharing the market equally, this anticipation evidently leads to the monopoly price, for, in effect, the market demand will be split into two equal parts, and each part will have the same elasticity (at any price) as the market

[12] The following data from our example summarize the point: (1) If both A and B produce 362 units, π_a = \$10,752; π_b = \$10,614. (2) If both A and B produce 367 units, π_a = \$10,751; π_b = \$10,618. (3) If A produces 366 units and B produces 368 units, π_a = \$10,714; π_b = \$10,653. For a geometrical illustration cf. T. Kristensen, "A Note on Duopoly," *Review of Economic Studies*, VI (1938), 56–59.

[13] In the hearings of the Temporary National Economic Committee on the beryllium industry (which is not offered here as an instance in which the assumptions of classical duopoly are fulfilled), one producer took this view:

"*The Chairman:* Suppose The American Brass Co. raises its price, but you are satisfied with your output and the profit that you are making at the old price. Why is it necessary for you to increase your price to your customers, who are already paying you a price sufficient to give you a profit that is satisfactory to you?

"*Mr. Randall:* I don't know that it is necessary; as a practical matter, if we didn't raise our prices with The American Brass Co. or other companies, whoever it might be, [*sic*] would put their price back to where it was."

The representative of the American Brass Co., on the other hand, said that price increases of rivals were met because it was felt that this company's product was just as good and worth just as much! (*Hearings before the Temporary National Economic Committee, Congress of the United States, Seventy-sixth Congress, First Session, Pursuant to Public Resolution No. 113 (Seventy-fifth Congress)*, Part 5, pp. 2087, 2097.)

demand curve. If B's marginal costs are lower than those of A (at given outputs), B will set a price slightly below the monopoly point in order to maximize his profits.[14]

If A insists on more than half of the total sales, this policy may lead to cut-throat rivalry if the firms are of equal size; for B can secure half of the market by matching A's price, on the assumption that customers pair at random since the product is homogeneous. A must cut prices to increase his share, and B must match A's price to secure any (and, as a result of the price cut, half) of the sales.[15] There is no solution short of agreement or elimination of one of the firms. If, on the contrary, the firms are of unequal size (measured in terms of marginal costs), the shares may be unequal, and yet a monopoly price will be attained.

It may be in order to point out here the distinction between correct and compatible anticipations. A simple case of correct anticipations would arise if A insisted on half of the market, while B insisted on two-thirds of the market, if each knew of the other's intention—but these anticipations are obviously incompatible. In such cases it is to be expected that the anticipations will be revised, but again we possess no definite information concerning the probable nature of the revised anticipations.

The second type of duopoly that can be discussed in general terms arises when equilibrium is established immediately, so that anticipations need not be revised. Aside from improbable chance, this situation will usually be based on possession of superior knowledge by one duopolist. The writer can think of no reasonable general illustrations of this case: the following are presented briefly to indicate the market mechanism.

(i) B *knows* that A will match any price cut; A *anticipates* that B will do the same. This case yields the same solution as if B merely anticipated that A would match price cuts, for B can do nothing more profitable than to set the monopoly price at once.

[14] The reasoning is identical with that for the case where it is anticipated that prices will be matched.

[15] That is, in the absence of rationing. Normally, rationing would suggest an explicit agreement, although there are some conditions (outside the present frame of analysis) under which B would accept, without agreement, a smaller portion of the market rather than engage in unlimited price competition.

However, if B's costs are higher, he may be able to persuade A (say by undercutting A's price cuts), to stop price-cutting at the point which maximizes B's profits.

(ii) B knows that A's policy is (Cournot-like) to treat B's output as fixed, so that B can set such an output that A will immediately go to the final equilibrium at which B's profits are maximized. B's knowledge may be profitable, but in our numerical example it yields a profit for B less than that secured by a

TABLE 1

COMPARISON OF NUMERICAL SOLUTIONS FOR TWO DUOPOLY CASES

Item	Monopoly Price Cuts Are Matched	A Assumes that B's Output Is Fixed; B Knows This
Selling price	$48.30	$32.50
A's output	367	392
B's output	367	658
A's profits	$10,751	$5,444
B's profits	$10,618	$10,456

monopoly price (i.e., when price cuts are matched), as is revealed in Table 1.[16] There seems to be little merit in exploring this case or extensions of this type of analysis to even more subtle anticipations,[17] until empirical investigations reveal cases where the

[16] For an extensive analysis of this case and of the related case in which both duopolists are in B's position (carried through for the purpose of proving that free enterprise is unworkable!) cf. Stackelberg, *op. cit.*, pp. 16 ff., 62 ff. The solution may be sketched for the present case as follows:

$$\pi_b = x_2\left[85 - \frac{x_1 + x_2}{20}\right] - \frac{x_2^2}{200} - 8x_2 - 3500,$$

where $x_1 = 691 - 5/11x_2$), according to the Cournot reaction function. This expression attains a maximum when

$$\frac{d\pi_b}{dx_2} = 85 - \frac{x_2}{10} - \frac{691}{20} + \frac{5}{110}x_2 - \frac{x_2}{100} - 8 = 0,$$

or

$$x_2 = 658.$$

[17] For such extensions cf. N. Kaldor, review of Stackelberg, *Marktform und Gleichgewicht*, in *Economica* (N.S.), III (1936), 229–30.

unusual (not to say unreasonable) assumptions on which these analyses rest are fulfilled.

We may summarize the theory of duopoly when the products are homogeneous and price and output are the only variables of policy. The usual solution will, of course, be agreement on price, although not necessarily at the monopoly level.[18] In the case of true duopoly, each duopolist will form anticipations with respect to his rival's behavior. At first and periodically thereafter when the data change significantly, these anticipations will frequently be wrong. As a general rule, no unique revision will be determined immediately by experience. It is to be expected that the revisions will usually be in the direction of fuller realization of the mutual dependence of the market policies of the two duopolists, in which cases prices will usually be higher than the original anticipations would suggest. Where the anticipations are correct or where equilibrium is established immediately, the duopoly problem is capable of solution in terms of the original data.

Since the foregoing analysis suggests that a near-monopoly price may frequently (and perhaps usually) arise, even in the absence of formal collusion, it may be worth while to consider a time-honored limitation on monopoly power: potential competition.[19] It is argued that the full monopoly price will not be set, if entry of new firms is possible, because new rivals would then be attracted. Instead, such a price will be established that no firm (including the prospective entrant) could cover costs or make profits if the total quantity of sales were shared equally.[20]

But the term "potential competition" is ambiguous. Are the

[18] It may differ from the monopoly level because of "economic" factors such as differences in costs or because of "noneconomic" factors such as administrative difficulties in changing prices with changes in data (see also Part II, below).

[19] Another popular limitation—the shifting of consumers to substitutes—does not require explicit attention, since the substitutes manifest themselves in the long-run demand curve for the product in question. The short-run demand curve will usually be less elastic, but, if the duopolists possess full knowledge of demand conditions, they will set a price which recognizes this factor. On new substitutes see Part II, below.

[20] This last statement is more precise than those customarily made. Other specific hypotheses would serve equally well, but some assumption must be made if the limitation on duopoly price is to be analyzed.

duopolists to set a price such that the entrance of one more firm would eliminate profits, or should the number of potential rivals be set at two or more? The analytical statement of the problem is helpful in revealing this ambiguity. Let $p = f(2x_1)$ be the demand function for the product, and $\phi(x_1)$ the total cost of each duopolist. Then, if profits are to disappear if a third firm enters, the price that will be set by the two duopolists will be determined by the equation

$$\frac{2}{3}x_1 f(2x_1) - \phi(\frac{2}{3}x_1) = 0.$$

In our numerical example, taking $\phi(x_1)$ to be A's costs, this yields the solution $x_1 = 671$, $p = \$17.90$—as compared with a monopoly price of \$48.80. If profits are to disappear when two new rivals enter the industry, then

$$\frac{x_1}{2} f(2x_1) - \phi\left(\frac{x_1}{2}\right) = 0,$$

and the solution in our numerical example is $x_1 = 645$, $p = \$20.50$. Since the profits of each duopolist are \$724 in the first case and \$2,341 in the second case, it pays to expect more rivals! By extension of this analysis it would appear that the two duopolists should set a monopoly price and expect a maximum number of new entrants.

Such reasoning seems very unrealistic, however, for it premises that the new entrant (or entrants) accepts the price ruling at the time of his (or their) entrance into the industry. The new producer may more reasonably expect that, once he is in the industry, a higher price will be set so that all producers secure profits. The old firms may, indeed, make it clear that they refuse to permit profitable operation by a new rival, but there are less expensive ways of doing this (e.g., by telephone) than operating at low prices. Monopoly profits, indeed, will be highly useful to finance price wars designed to discourage new rivals. The writer would conclude that potential competition does not in general exert any influence on duopoly (or monopoly) price.[21]

[21] In particular cases, however, potential competition may be effective; for example, smaller profits may be concealed more easily and hence can be retained longer.

II

In the present section, the theory of duopoly will be extended to include variables of market policy other than price and output. The analysis will begin with the rather simple extension of the theory of duopoly price to differentiated products.

Duopoly with differentiated products.—In the case of duopoly with differentiated products, the possibility of price competition becomes slightly more realistic. There is no longer the obvious necessity (in the absence of rationing) for price uniformity that rules when products are homogeneous.[22] When the products are differentiated, one duopolist may sometimes reasonably believe that his price cuts will be ignored or at most only partially matched, and then perhaps only after a time lag.

A general formula is easily deduced for the duopolist contemplating a price cut. The following notation is employed:

$$\begin{aligned} x_1 = f(p_1, p_2) &- \text{demand function for A}, \\ p_1 &- \text{price of } x_1, \\ p_2 &- \text{price of } x_2, \\ \phi(x_1) &- \text{total cost of producing } x_1. \end{aligned}$$

Duopolist A's net profits will be

$$\pi_a = p \cdot f(p_1, p_2) - \phi(x_1).$$

For this to be a maximum,

$$\frac{d\pi_a}{dx_1} = p_1 + x_1 \frac{dp_1}{dx_1} - \phi'(x_1) = 0. \qquad (2)$$

Since $x_1 = f(p_1, p_2)$

$$\frac{dx_1}{dp_1} = \frac{\partial x_1}{\partial p_1} + \frac{\partial x_1}{\partial p_2}\frac{dp_2}{dp_1},$$

[22] An interesting example is provided by phonograph records, because they are purchased by consumers who are presumably somewhat more competent to judge than is customary in such markets as patent medicines. For twenty-five albums selected at random, Victor's price averaged 40.1 per cent higher than those of Columbia, and in no case was Victor's price as low as Columbia's.

and substituting into equation (2),

$$p_1 + x_1\left(\frac{1}{\frac{\partial x_1}{\partial p_1} + \frac{\partial x_1}{\partial p_2}\frac{dp_2}{dp_1}}\right) = \phi'(x_1)\,. \tag{2.1}$$

Let the following elasticities be defined:

$$\eta_{11} = \frac{\partial x_1}{\partial p_1}\cdot\frac{p_1}{x_1} = \frac{\text{relative change in } x_1}{\text{relative change in } p_1},$$

$$\eta_{12} = \frac{\partial x_1}{\partial p_2}\cdot\frac{p_2}{x_1} = \frac{\text{relative change in } x_1}{\text{relative change in } p_2},$$

$$\beta = \frac{dp_2}{dp_1}\cdot\frac{p_1}{p_2} = \frac{\text{relative change in } p_2}{\text{relative change in } p_1}.$$

If these are substituted into equation (2.1), we secure

$$p_1\left(1 + \frac{1}{\eta_{11} + \beta\eta_{12}}\right) = \phi'(x_1)\,. \tag{2.2}$$

It is clear that $\eta_{11} < 0$ and probable that $\eta_{12} > 0$. (η_{12} would be negative if x_1 and x_2 were complementary; the reader can readily modify the interpretation for this case.) Since a fall in the price of x_1 will attract new customers as well as purchasers of x_2, $|\eta_{11}| > \eta_{12}$. The elasticity β, the anticipated price reaction of duopolist B, will almost always be limited to $0 \leq \beta \leq 1$. If $\beta = 0$, the solution reduces to simple monopoly. If $\beta = 1$, the solution again is a monopoly price, but now monopoly in the sense of the price that would be established by agreement (which will be higher than if $\beta = 0$, for $\eta_{11} < \eta_{11} + \eta_{12} < 0$). It is apparent by inspection of equation (2.2) that the greater β is, the higher A will set his price.

But even with differentiated products there is relatively little evidence of price competition. Competitors are usually sensitive to prices of rival products, much more so than with respect to other variables of market policy. Entrepreneurs who will tolerate no discrepancies in prices will be much less insistent on uniformity in advertising expenditures or techniques, research policies, technical changes in products, etc.

This sensitivity to prices is due in large part to two circumstances. First, prices are usually the most precisely measurable variables of market policy,[23] and it is difficult to maintain a consistently higher price except in the most uninformed consumer markets. But quality of product, for example, is less easily measured; it is not possible for the typical consumer to decide definitively between V-8 and six-cylinder motors as he can between prices of $900 and $800. Second, prices have been the publicized variable of market policy: there are a thousand denunciations of the price "chiseler" to one of excessive advertising, and some competitive policies (e.g., quality improvement) dare not be criticized publicly because of strong moral sanctions. The subsequent analysis of nonprice variables for the case of independent duopolists may therefore claim considerably more realistic significance.

Duopoly in other variables of policy.—Since the formal development is the same in all cases, it will be sufficient to consider advertising expenditures. Then A's demand function is $x_1 = f(p_1, p_2, a_1, a_2)$, where a_1 and a_2 are A's and B's advertising expenditures, respectively. A's costs will be $\phi(x_1, a_1)$. A's profits will be

$$\pi_a = p_1 f - \phi .$$

If price is treated as a constant, in the light of the preceding discussion, then π_a attains a maximum when

$$\frac{\partial \pi_a}{\partial a_1} = p_1 \frac{\partial f}{\partial a_1} - \frac{\partial \varphi}{\partial a_1} = 0 .$$

Since

$$\frac{\partial f}{\partial a_1} = \frac{\partial x_1}{\partial a_1} + \frac{\partial x_1}{\partial a_2}\frac{\partial a_2}{\partial a_1},$$

$$p_1\left(\frac{\partial x_1}{\partial a_1} + \frac{\partial x_1}{\partial a_2}\frac{\partial a_2}{\partial a_1}\right) = \frac{\partial \varphi}{\partial a_1} . \qquad (3)$$

[23] Nor is the situation greatly affected by such things as credit terms, quantity discounts, etc., for these are also subject to fairly precise quantitative measure.

It is apparent that, in general,

$$\frac{\partial x_1}{\partial a_1} > 0, \quad \frac{\partial x_1}{\partial a_2} < 0, \quad \text{and} \quad 0 \leq \frac{\partial a_2}{\partial a_1} \leq 1.$$

Furthermore, since advertising attracts new customers to A (and to B), as well as old customers away from B,

$$\frac{\partial x_1}{\partial a_1} + \frac{\partial x_1}{\partial a_2} > 0.$$

As a matter of fact, the net gain of new customers to the "industry" is equal to $(\partial x_1)/(\partial a_1) + (\partial x_2)/(\partial a_1)$, and this expression may be almost as large as $(\partial x_1)/(\partial a_1)$, if the advertising is opening new markets for the commodity. Where $(\partial x_2)/(\partial a_1)$ is negative and small or zero, $(\partial a_2)/(\partial a_1)$ may reasonably be taken to be small or zero also.

It is noteworthy that the many possible dimensions of an advertising program will be an invitation to take $(\partial a_2)/(\partial a_1)$ as small. For the duopolist who first conceives and exploits a new appeal (e.g., the tobacco auctioneer) will have a definite time lead, and perhaps the subject of the appeal is not easily imitated.

Two extensions of this analysis could easily be made without introducing new principles. A could anticipate that a change in his (e.g.) advertising policy would be followed by B after a time lag. This lag might be a constant or, more plausibly, a function of the difference between A's and B's advertising expenditures. Again, A might determine his advertising policy on the basis of an extrapolation of the trend of B's expenditures. Such assumptions resemble Cournot's hypothesis, and they lead to greater advertising expenditures than would arise under simple monopoly.

Especially when uncertainty is present, and this is usually an easily conceded assumption, there is considerable support for the view that duopolists will engage in many forms of rivalry. Such rivalry has frequently been pointed out in the field of advertis-

ing,[24] and the evidence is also fairly clear in research in product improvement, cost reductions, expansion of investment in an expanding industry, and similar variables.[25] To these and other forms of rivalry the theory of duopoly is completely appropriate.

Duopoly in product variation.—So far the products of the duopolists have been taken for granted; their determination (product variation) offers complex problems. In determining his type of product,[26] a duopolist is torn between two desiderata. The more closely his product approaches that of his rival, the greater the portion of his rival's customers which can be attracted. On the other hand, the more distant a substitute his product is for his rival's, the higher a price he can charge for his own product. The ideal situation would be for his product to attract all his rival's customers, but for his rival's product to attract none of his, i.e., to possess a monopoly! But rarely is it possible to attain such a position, although many advertising policies are obviously directed toward this goal.

No general analytical device has yet been developed for the treatment of this problem.[27] The fact that product "quality" has a very large number of dimensions will be of basic importance in any general theory. Thus, "automobile" is a composite of horsepower, design, upholstery, prestige, repair facilities, and other equally diverse elements. These numerous dimensions make it

[24] Cf. H. Smith, "The Imputation of Advertising Costs," *Economic Journal*, XLV (1935), 682–99; A. R. Burns, *The Decline of Competition* (New York, 1936), chap. viii, pp. 225 ff.

[25] Compare the excellent discussion by D. H. Wallace, *Market Control in the Aluminum Industry* (Cambridge, 1937), chap. xv. He emphasizes that "without transgressing the limits of strictly rational pursuit of maximum profit it may still be possible to gain appreciable advantage at the expense of one's rivals" (p. 338).

[26] Defined in terms of consumer preferences, so a product may be changed by changing advertising appeals.

[27] The existing locational studies have very limited applicability for reasons that will appear in the subsequent discussion. The most promising theoretical concept of which the writer knows is that of the *Monopolgebiet* (a market area whose dimensions are the variables which determine the demand for all commodities); cf. G. Tintner, "Die Nachfrage im Monopolgebiet," *Zeitschrift für Nationalökonomie*, VI (1935), 536–38.

possible for a duopolist to achieve in a degree the contradictory objectives mentioned above.

A duopolist will attempt to maintain certain permanent differences in his product, in order to give continuity to his consumer following. But very frequently these more or less permanent differentia of his product cannot be physical; he must then rely on brand name and advertising slogans for continuity of consumer following. The inability to maintain permanent physical differences arises out of the desire (and usually the ability) of rivals to imitate any physical difference which possesses recognized consumer appeal. For example, Plymouths were the first of the low-priced cars equipped with hydraulic brakes; Chevrolet and Ford were literally forced to add this feature. Only where effective patents or some similar device protect established physical differentia of a product is this differentiation a permanent basis for continuity of consumer following. Typically, however, the duopolist must resort to advertising slogans—which are in turn also open to imitation.

But a duopolist is not content merely to imitate attractive features in his rival's product; he seeks also to develop new differentia of his own product. The limits of such development vary widely between products. It is difficult to conjure up new qualities for essentially homogeneous products like aspirin and soda water, although some efforts in these directions are extremely ingenious. In those cases where product variation is difficult, a very common policy is to introduce new (and perhaps completely unrelated) products which will be subject, at least temporarily, to lighter competitive pressures.

It may be remarked, finally, that these competitive pressures will necessarily lead to product improvement (defined in commonsense terms) only in a relatively informed market.[28] Salesmanship and real quality improvement (e.g., durability) are very good substitutes for one another in uninformed markets. To take an ex-

[28] The automobile industry may appear to be an exception, for there quality improvement has accompanied apparently increasing ignorance of technical features by the consumer. But a durable product usually implies a relatively informed market, because consumers can judge on the basis of past experience.

treme example: It is profitable to sell high-grade securities at low commissions but with low selling costs; it is also profitable to print equally attractive, if less negotiable, certificates and maintain sales by increased selling expenditures, which may well be less than the savings in "production" costs.

Two implications of this discussion of product variation seem worthy of mention. First, duopoly with product variation is in large part a historical ("dynamic") process. If variation of product is profitable, it will be continuously characteristic of such markets. Secondly, the n-dimensional nature of commodities will increase the number of duopoly relationships, i.e., even if there are many firms making a "commodity," usually only relatively few of these firms will be emphasizing the same qualities of product and appealing to the same consumer groups.

THE INSTITUTIONAL MAN

HARVEY PINNEY
New York University

I

A GENERALIZATION about man embodying a clear-cut concept is necessarily an abstraction—a symbol. The usefulness of the symbol as an analytical element will depend upon the precision with which it is defined so that (1) that portion of man's nature which it is meant to describe is accurately identified and (2) the limitations of the symbol are understood—the area to which it does not apply is recognizable.

Man is a two-legged animal. This generalization has a high degree of accuracy so far as pedal mathematics is concerned. The exceptions are abnormal and accidental. Yet there are certain essential connotations. One has a more or less particularistic visualization of human legs paired—distinguishable from all other two-legged beings. It is further recognizable that the symbol says nothing about the legs other than that they are two and human. They may be fat, lean, straight, crooked, hairy, hairless, light, dark, smooth, lumpy, strong, weak, etc. The biped connotation also suggests structure, posture, method of locomotion.

If we maximize the physical characteristics accurately represented in the generalization or symbol, we minimize the area over which the symbol may be applied. An anthropometric definition of a "race" is an illustration. The specification of particulars can be carried to a point where the total description becomes unique and applies to but one individual.

Leaving the field of generalization about physical characteristics, the problem of validation of descriptive symbols becomes even more difficult. We have, for the past century and a half, lived under the influence of two dominant and interrelated symbols—generalizations as to the nature of man—both of which are now in process of being discredited. They are (1) the *economic man* and (2) the *rational man*.

There is an important conceptual affinity between these two symbols. The commercial-industrial revolution was rationalized by and found expression in the concept of the economic man. Its basic connotation was materialistic. Man's primary concern was with the accumulation and manipulation of economic goods. Society should recognize this preoccupation and should so organize as to garner the greatest possible benefit from its application.

The rational man was a symbol of the victory of the intellectual revolution—that struggle which freed the mind from domination by authority, tradition, and superstition and made possible the development of pure science, the fructification of applied science. It was the dominant symbol of the age of reason, the major premise of humanism, the foundation of science, the justification for democracy, the imperative for general public education.

The link between the two lies in the assumption that the economic man is economically rational—that is, he rationally pursues his own economic self-interest. The social importance of this lay in the further assumption that maximizing the wealth of individuals promoted the national welfare and that in the nature of the economic process prosperity was reciprocal among economic units within the limits of the canons of productive efficiency.

It has been discovered, however, that the symbols *economic man* and *rational man* suffer from certain defects. These defects may be illustrated by certain propositions: (1) no man is rational in all his conduct; (2) rational pursuit of economic self-interest is possible only in proportion to the accuracy and completeness of the knowledge possessed by the individual; (3) few individuals are strictly rational in their economic activities within the limits of facts known to them; (4) the economic activities of most individuals are influenced by noneconomic factors which may be rational in terms of pursuit of noneconomic ends; and (5) large areas of human conduct, economic and otherwise, are influenced by varying degrees of nonrational or irrational motivation. It is not necessary to demonstrate or quantitatively to evaluate these propositions. Their main import is now well recognized.

The chief point to be made is that (1) there is no area of human conduct which is purely rational; (2) there is no class of human

beings who are strictly rational in a given area of conduct; and (3) there is therefore no class of individuals who are strictly economically rational, to say nothing of the population at large. The symbols *economic man* and *rational man* are consequently extremely inaccurate and ambiguous in meaning and erroneous in their implications. The idea of economic man emphasizes the importance of economic interests—which all will grant. The idea of rational man emphasizes a quality of human action distinguishing man from animals and suggesting potentialities of development that are fascinatingly attractive. Beyond this, however, such symbols must be used with great caution.

The development of various brands of institutionalism suggest the possibility of delineating the features of what might be called the *institutional man*. Can such a symbol be made sufficiently sharp to be reliable while remaining sufficiently general to serve the purpose as generalization? Can it be made more meaningful than the statement that "man is a social animal"?

II

The meaning of the term *institutional man* waits upon a clarification of the word "institution." "Institution," however, cannot be accurately defined without developing some fairly precise concepts as to man himself. Institution is necessarily social. We are therefore primarily concerned with social behavior. To avoid a long and detailed exposition of the heredity-environment relation, we can make certain assumptions which may, at some later date, be subjected to critical analysis. Whatever may be subsumed under the term "original nature of the human organism" can be said to be substantially modified by environmental conditioning. That which is eventually produced, and which we often term "human nature," is basically a social product. It consists of (1) reflexes conditioned by social adjustments, (2) subjective responses to actual or potential situations, and (3) overt behavior which has reference to social situations.

There is built up in the individual a set of reflexes which, upon the occurrence of the appropriate stimuli (which may be real or imagined), produce affective states in the organism which eventu-

ate in subjective or overt behavior or both. The affective states generated by ritual or ceremonial situations or events illustrate this phenomenon. Further, human nature is self-conscious, and the apparent status of the self in the eyes of others is an important component of both subjective and overt behavior. The notion one has of one's self is a combination of the reflection of that self in the attitudes of others and the reaction of the ego to that reflection—acceptance, magnification, minimization, rejection. Generally speaking, no basic urge can be satisfied without the influence of this complex socially induced conception of self. Consequently, overt behavior is substantially influenced by the individual's urges conditioned by his forecast of the effect of his acts on this social reflection of self.

The social reflection of self is a function of the relation of the individual's conduct to accepted social norms. "Normal behavior" is by no means a precise, sharply defined concept. Yet its margins are observable, and in certain types of situations they may be quite sharp. The security of in-group belongingness rests in large part upon the individual's conforming to the accepted norms of behavior held by the group. The more homogeneous the group, the more tightly knit its organization, the more rigidly precise its doctrinal system of values, the more clear cut are the margins delineating norms of behavior. Prestige within the group rests upon excelling in conduct prescribed by the norms. Naturally, the looser the in-group bonds, the more difficult is the definition of normal behavior. The multiplication of overlapping group boundaries (as in cosmopolitan areas) also maximizes the indefinability of normal behavior. By and large, however, the difficulties raised are not insuperable since the modes of conduct imposed by the economic order, on the one hand, and the nation-state, its instrumentalities, and religious organizations, on the other, tend to create certain complexes of uniformities which become norms.

To anticipate briefly, this behavior we call "normal" is essentially institutional behavior. As a matter of statistical averages the behavior of the average man (within a defined group) is normal. The proposition may be advanced that all social behavior

tends to be normal (i.e., institutional) and that, once a systematic explanation of that behavior is achieved, the real problem of social analysis appears in two other areas: (1) the departure of individuals from the norms of the dominant in-group, or the departure of a minority group from the norms of a dominant majority, and (2) the dynamics by which the norms themselves change with the consequent modification of "normal" individual behavior.

One further word on "normal behavior." Normal behavior is uniform behavior in time—a pattern of recurring patterns. In a stable society where norms change slowly and imperceptibly, the recurring patterns may roughly follow the cycle of generations, each succeeding generation following, by and large, in the footsteps of its predecessor. Normal behavior is habitual, routine, comfortable, and (barring upsetting factors) enduring. Normal behavior is normal—the rule rather than the exception.

It is this disposition on the part of the human organism to adjust itself to a routine pattern of behavior in which it feels comfortable and secure, which makes possible collective living, organized society, and which is what we may call institutional behavior. It is founded firmly on the principles governing habit formation and on the characteristic of enduring momentum which habit has. It rests upon the fact that all the processes of the organism are "normally" habitual and generally rhythmical. This includes the type of "action" represented in thought and in the cyclical occurrence of affective states. It is upon this organism, this conception of human nature, that the institution is founded.

III

Behavior is action. Social behavior is social action. A basic concept in institutional behavior is the nature of the act itself. I am indebted to Professor Talcott Parsons[1] for the general outline of the ideas here set forth.

Life is continuous. All action is continuous. No single act stands by itself. Every act is the consequence of an endless chain

[1] Talcott Parsons, *The Structure of Social Action* (New York, 1937). See an extended analysis of this work in Harvey Pinney, "The Structure of Social Action," *Ethics*, L (January, 1940), 164–92.

of acts extending into the past. Better still, every act is a point in the seamless continuity of space-time. Its antecedents fan out in history and are lost in the past. It has relations with other acts in the contemporaneous present, all of which may funnel back to points of dominant action in the past. The consequences of the act may fan out into the future; or it and its contemporaries may generate influences which funnel down toward some single future act. Thus causal sequence is more easily assumed than proved. The significant consideration here is that the isolation of a particular act for purposes of analysis must be recognized as a strictly limited procedure but that the postulate that any given act is integrally related with a pattern of acts is a valid one.

The act has a set of elements: (1) the actor—objectively the human organism, subjectively (or, in the sense that "state of mind" is an objective fact for the observer, objectively) the ego; (2) the end or object of action (satisfaction of tension); (3) the means (potential—available to the actor; actual—which the actor uses); (4) the conditions (if the act is possible to the actor concerned, the conditions are the limitations under which he may perform the act and include the means he must use, the means he may use, and the limitations he cannot transcend).

If the actor wants to play the violin, he must (1) have the external means, including violin and bow, and (2) have the internal means, including physical capacity, musical sense, and skill. If a qualitative standard is set, then the qualities of the actor's physical makeup and the availability of that energy called "will" become means; their deficiencies become limitations. The availability of instruction and the depth and richness of the musical tradition (culture) of which he is a part or to which he has access are factors. The character of the music he may want to play will be deeply influenced by this musical tradition.

The end is a function of the dynamic relation between the individual organism and its physical-social-cultural environment. Thus the incitement to energy release is a physiological tension. The end of an act may be to satisfy the tension of hunger. What is eaten, how it is prepared, and how and when it is eaten may be largely determined by the cultural environment. On the other

hand, the tension may be externally induced—the end may be to achieve a standard of living or display comparable to or better than certain neighbors. The difference between the envisioned and the existing state creates the tension and points to the direction of energy release. The end in this case, as well as the means, is culturally determined—a part of the mores of the community. The amount of energy which will be expended to achieve the end is a resultant of many complex factors one of the most important of which is the original nature of the organism—its capacity to turn the raw material of food into energy, and the strength of the element called "will" in directing that energy persistently toward the objective.

Both ends and means are predominantly influenced by the culture complex. The value system governing a community determines the conception of ultimate ends and prescribes the acceptable modes of conduct for reaching these ends. These modes of conduct may be means or limitations, depending on the situation, and are intimately related to the state of the arts—technology. Advances in technology may necessitate the revision of standards, of modes of conduct, and may lead to the development of a different set of ultimate values—a favorite theme of Veblen's.

If individuals are taken in large numbers, certain probably verifiable assumptions become possible. There is a "normal" distribution of physical characteristics of the organisms—size, energy, metabolism, I.Q., etc. In a relatively stable society there is a normal and verifiable, discernible departure from the norms of conduct—that is, from subordination to the mores of the group. In a stable society the large mass of individuals will hold roughly the same ends, the same standards of conduct, and will exhibit a normal distribution of energy release in pursuing the ends. Obviously, the more dynamic or unsettled the society, the more difficult the analysis becomes.

To understand a given act, therefore, it is necessary to construct a frame of reference—or a compound of frames of reference. A frame of reference will include (1) the statistical description of the group of which the individual is a part resulting in a roughly ideal type, (2) the system of values to which the group adheres,

(3) the derivative standards governing modes of conduct used to achieve ends, and (4) the technology available for use. The necessity for a compound of frames of reference lies in the fact that most individuals are members of several different groups each of which has values and mores of its own. One might start with Western European society for the statement of certain values, say, the assumption of individual liberty. (A somewhat broader frame might be Christianity.) A second construct could be made for the United States; a third for the church; a fourth for the union or other economic association; a fifth for the social group; etc. Each frame of reference for a subordinate group would exhibit characteristics due to the influence of the elements isolated in the frame of reference for the larger group. Thus we might discover that an individual is dominated by a "Christian" (Protestant) value of good works measured by property accumulation, a societal value represented in the laissez faire notion of freedom of individual enterprise, the associational value justifying the demand for tariff protection, the church community value promoting charitable acts, the club value inducing an in-group solidarity on class and occupational lines. These ends would be implemented or conditioned by accepted and available means, including the derived standards of conduct in specified fields of human relations (businessman to businessman; employer to employee); by the system of private property and the general limitations imposed by law; by the availability of organizational tools (industrial, business, political), or their lack; by the availability of the more strictly defined technological factors.

These frames of reference having been constructed for the group in question (the United Mine Workers, the National Association of Manufacturers, share-croppers, dairy farmers, college seniors, etc.), there then arises the problem of constructing a master-frame of reference—that is, an evaluation of the interrelations of these various factors so that norms of conduct may be discovered. These norms having been stated and verified with a determination of their accuracy by determining the usual amount of deviation, acts which fit the normal pattern may be termed normal for that group.

The analytical problem then becomes one of deviations. It is to

discover what factors lead to acts departing markedly from the established normal pattern and to explain them. The problems are legion in this field. However, it may be found that, in a given established pattern of normal behavior, certain qualitative deviations recur with sufficient uniformity to constitute a "normal" deviation from that pattern of behavior. An example would be the incidence of suicide in a given army. There might be other such normal deviations due to various factors such as low I.Q., physical defects, alcoholism, etc.

Not only, however, are there individual deviations; there are group deviations. Many interesting problems appear in attempts to explain the departure of the Mennonites, Mormons, Christian Scientists, Communists, Greenwich Villagers, Ku Kluxers, etc., from the more standardized forms of behavior of the general community.

It is, of course, readily apparent that a frame of reference once constructed is subject to change. The change may be necessary due to inaccuracies in the statement; but it may also be necessary due to changes in the underlying patterns of behavior which the frame of reference describes. Thus it is plain that the concept of free competition no longer holds the position in the scheme of values in our society that it once did. These changes in the underlying patterns must not only be perceived and recorded, but stand themselves in need of explanation. Any valid interpretation of past sequence which enables forecast of trends affords quite valuable knowledge. The development of such knowledge of changes is a function of the understanding of the reciprocal relations between the original nature of human organisms and the environmental complex. All philosophy of history wrestles with this problem, but no mastermind has yet appeared with an impregnable solution, though some very grandiose attempts have been made.

Normal behavior exhibits three main types of pattern. There is a positional pattern in which each individual occupies a point which has discernible relations with other points in the group system (geographical as in ecology; topological[3] as in social psychology). Second, there is the pattern made by the conduct of each

[3] See J. F. Brown, *Psychology and the Social Order* (New York, 1936), for the development of this concept in social psychology.

individual in time—the uniformity we call habit. Third, there is the pattern made by the group as a whole in time which may involve no change in topological position, or no regular change in it, but which has uniform recurrences justifying the term "pattern." Most acts of social significance are points in such patterns. If the pattern is correctly observed and described and the analysis of elements carefully made, the result is a set of facts usable for analysis of related patterns—larger, smaller, overlapping. Thus is the knowledge of social action to be built up.

IV

The influence of the culture in which an act takes place upon that act is an essential element in the analysis of that act or any pattern of which it is a part. The kind and degree of such influence is not easily determined. Perhaps the two most basic elements in the culture are language and technology (representative of the nonmaterial and the material portions). Language is more than words, more than syntax; it is a system of behavior. It has a structure of grammar, a clothing of words, a life of meaning. In transmitting this life of meaning, language gives continuity to behavior patterns. An individual speaks more than words, more than the ideas his sentences contain. He speaks with more than his voice. The whole organism is involved in speech and the ultimate meaning conveyed is the result of the *Gestalt* of the situation. Illustrations of this are endless. On the screen Charley Chaplin was most eloquent without words. In Bernard Shaw's *Pygmalion* the play is based on the definability and discernibility of speech patterns which link the individual to a particular group. It is through the *Gestalt* of speech thus conceived that the child absorbs the general behavior patterns of parents, school, community, church, nation, culture. The nuances and overtones of language fill the mind and canalize the flow of affective states. The behavior of the individual is an expression of what is inside, and what is inside has been given form and substance by the language content.

Every discernible group has its language *Gestalt*—its argot of words, phrases, sentences, gestures, poses, connotations, infer-

ences, implications— from the drugstore gang on the street corner to the inner councils of the Masons or Knights of Columbus—or a diplomatic ménage. Breaks from the normal flow of the language pattern of an individual signify disturbances in the personality—a principle used in the lie-detector and in the psychological laboratory.[3] Thus it is possible not only to record the "normal" *Gestalt* of group or individual language patterns but to discover typical aberrations from this norm which signify typical forms of personality maladjustment. So also one of the basic methods of prehistorical (and even historical) research is to trace the etymology of key terms attempting to garner as much of the meaning as possible from the way such terms, or their cognates, were used in the fragments of literature available.[4] Through such a process it becomes possible to reconstruct the "spirit-of-the-times" content of past situations.

The material elements of culture, the technological instruments available to a group, are also important in influencing behavior patterns. The broadest division is between a societal dependence on nature with a minimum of tools (food-gathering stage) to a substantial independence of nature based on the accumulation of knowledge and implements sufficient to free the group from the vagaries of weather, blight, disease, and other natural interventions in food production. The one situation is productive of ritual or ceremonial behavior designed to induce a favorable response from nature; the other is productive of a self-dependence based on the apparent fact that man's material welfare depends on himself. We now seem to be moving in the direction of a new mystery—for the common man—the mystery of the machine over which he has as little control as he formerly exerted over nature or God.[5] What

[3] See A. R. Luria, *The Nature of Human Conflict or Emotion, Conflict and Will* (New York, 1932), for detailed illustration of the application of this principle.

[4] For extended application of this technique see John L. Myres, *The Political Ideas of the Greeks* (New York, 1927), and Reinold Noyes, *The Institution of Property* (New York, 1936); see, on the latter, Pinney, "The Institution of Property," *Temple University Law Review*, XIII (February, 1939), 182–200.

[5] See the interesting volume compiled by Jesse E. Thornton, *Science and Social Change* (Washington, 1939), especially the first essay by James R. Angell, "Popular and Unpopular Science."

behavior patterns this situation may develop is not yet clear save for the almost universal trend toward activism on the part of dependent populations—a trend with a very complex causal basis.

The development of an extensive and complex technology (including both instruments and theoretical and applied scientific knowledge) has certain other major influences on behavior patterns. In the first place, it has necessitated division of labor and specialization and has consequently mechanized productive labor for large segments of the population. This specialization has a "dispersive"[6] effect on group interests resulting in large aggregations which fight for particularistic interests. In the second place, it results in the necessity for personality expression to find an opportunity outside work activity, and this has resulted in a complex of leisure-time behavior patterns, most of them dominated by the business exploitation concepts (commercialized amusements). In the upper strata of society the specialization has likewise resulted in the maximizing of particularistic knowledge and interests until, in the field of government especially, the problem of integration and co-ordination of multitudinous diverse operations in the interests of the general welfare is becoming the most crucial political problem of the age. Technology as a means to social ends may be obstructed by established cultural behavior patterns which the momentum of technological advance is incapable of breaking down. Thus the established system of private property and the evolution of its management culminating in businessmen and bankers has resulted in an impasse between the technological potentialities for material welfare and the conditioned behavior of the managers of property rights leading to an effective (if unintentional) sabotage of the society's productive capacity. This, too, was a favorite theme of Veblen's.[7] Nor, of course, does labor escape the influence of the property system; it too, on occasion, retards technological advance because of established notions of rights and self-interest.

[6] This is one of the best insights in Ernest S. Griffith's *The Impasse of Democracy* (New York, 1939).

[7] See N. R. Danielian, *A.T. & T.* (New York, 1939), for explicit illustration of the point. Additional up-to-date materials are to be found in the reports of the Temporary National Economic Committee hearings.

This brief discussion of culture has not attempted to set forth the chief elements in the culture system of the United States. It has rather attempted to suggest the importance of culture by indicating the type of influence exerted by the language complex, the technological accumulation, and the system of property rights governing the development and use of technological instruments.

The discussion thus far has developed the following two propositions. (1) The human organism is so constituted as to accept the conditioning of environment, to organize the organism-environment relation into a pattern of behavior discernible in uniformities of conduct in time, and to further organize such patterns into social patterns of behavior in space and time. (2) Any given act can be analyzed in terms of a frame of reference the elements of which are (*a*) actor, (*b*) end, (*c*) means, and (*d*) conditions; previous conditioning is implicit in the description of the actor, technology and environment are encompassed in means and conditions, value system (culture) is the main determiner of ends. The analysis may be applied to the act of an individual or to that of a group.

We come now to the question "What is an institution?"

V

An institution is a discernible, definable, durable pattern of social action. It is a system of relations the essence of which is a habitual routine of individual action interrelated by a degree of psychological awareness of the positional pattern made by other individuals acting within the institution or in relation to it.[8] The positional pattern is spatial and topological. Almost all social relations are deeply influenced by an apperceptual landscape of spatial and physical relations—the location of furniture in the home, one's room, corner, or chair, the altar-priest-worshiper pattern in the mass, the man-woman-altar pattern in the marriage ceremony, the "home place" nostalgia, and so on in infinite illustration. Topological position is another apperceptual system whose basic connotation is a pattern or congeries of patterns of

[8] For overtones on the definition of institution in his own inimitable style see Walton H. Hamilton's article, "Institution," *Encyclopaedia of the Social Sciences.*

dominance and subordination—leadership, power, office, class, competence, or any other category involving a status of psychological precedence. The highly important institutional fact is that this awareness is a habitual subjective activity resulting in overt behavior which preserves the institutional pattern. The most deeply rooted institutions are those in which this awareness of positional relations is so completely conditioned into its participants as to exhibit a response of a quasi-reflex variety—so that the "awareness" becomes more a subconscious and constant orientation of the organism than a conscious intellectual recognition.

This idea of durable pattern of social conduct in space-time is the essence of the institution. It is three dimensional—spatial relations, time relations, topological relations. Its significance is that an institution having been accurately described, the normal mode of conduct for its members has been indicated. The observer can then concern himself with (1) deviations, normal and otherwise, (2) interinstitutional relations, and (3) institutional dynamics.

The essence of the relation is psychological. Each member of an institution behaves toward every other member as he has been conditioned to do. The persistent uniformity of his conduct is due to a complex of factors: habit, sanctions, rationality. That is, the conduct may be the unreflective performance of unquestioned habits; or the habits may be enforced by social sanctions, legal sanctions, or discomforts inherent in variation; or the habits may be reinforced by an understanding of their rationality as effective means to a desired end. In all cases the institutional pattern as a concert of individual acts is psychological, though these psychological relations may be reinforced by the permanence of physical spatial patterns.

The institutional pattern displays structure or form. The institution has a center of dominance around which the institutional activity is built. These centers are organizational, geographic, and ideological. Since the institution is social, there is a co-ordination of individual activities (the pattern) which achieves the function which the institution serves. Two basic patterns appear—one organizational, one functional. Organizational patterns have two

primary forms—hierarchical and associational. The former is dominant and may be distinguished in three primary subforms. First, there is the hierarchical-authoritarian form. This form has a broad base of members (the laity) who are on a horizontal-associational level, but above whom extend several ranks of functionaries who reach eventually to the head—usually single. Authority is exercised by the head and transmitted down the hierarchic line to the laity. Authority is generally based on (*a*) an accepted value system, (*b*) a systematic manipulation of symbol, accoutrements, rituals, (*c*) psychological dependence of the masses of men, (*d*) force. The strength of authority frequently lies in a long-established tradition. Second, there is the hierarchical-functional form. In this form there is again a broad base (unskilled or semiskilled) above which extends rank upon rank of expert supervisors culminating in a head (general manager) who may in turn be supervised by a policy-agency (owner, board of directors—the head of the authoritarian aspect of this organizational form). The basic element in this form is division of labor in large-scale operations, which inherently demands the hierarchical form to supply the combined needs of expert supervision and step-by-step co-ordination. Authority is exercised but is derived fundamentally from rational requirements—a division of labor culminating in a pyramid of directoral competence in which leadership in terms of competence is accepted because it is the best means to the end. Third, there is the hierarchical-representative form whose broad base is the general membership, whose hierarchy is composed of rank upon rank of delegates or representatives rising usually to a plural head (executive-legislative). This form serves as a co-operative device by which the members agree upon common ends and the methods to be used to achieve them and the persons to exercise the directoral or compulsive authority. The authority of the hierarchy lies in its leadership, and its power rests upon the consent of the membership.

The associational pattern is very similar to certain aspects of the hierarchical-representative form. It is represented in co-operative action on a horizontal level and therefore is usually exemplified in small areas where the association is primary, face to face.

It may, as an institution, have a wide geographic distribution with no necessary organizational superstructure linking the segments together. The local association (consumers' co-operative, town meeting) may be integrated into a hierarchical-representative system under appropriate circumstances.

Naturally, while these forms may be distinguished and described, they are rarely found in a pristine structural purity. It may be said, however, that observation indicates a disposition for all forms to gravitate toward the first—the hierarchical-authoritarian form. There may even be detected a pendular motion between breaking away from and returning to this dominant form. Yet the viability of the hierarchical-authoritarian form depends to some degree on its preserving characteristics common to the other two—competence in the hierarchy and the consent of the led. Many institutions exhibit the hierarchical-authoritarian and the hierarchical-representative characteristics in juxtaposition. The latter is the consent-giving, co-operative-determination-of-ends-and-means mechanism, while the former is the administrative mechanism which executes decisions.

The functional form of organization is one which cuts horizontally across other forms. ("Functional" is used for lack of a more accurately descriptive term.) Such an institution involves a pattern of patterns of broad application which enter into certain other institutions at particular points in the institutional conduct. Institutional activity may be geared to the calendar and take place regularly with all persons concerned performing appointed functions; or such activity may be contingent upon other events. The institutional pattern may be a ceremony or ritual called into application by certain other acts (marriage), or it may be a vast body of rules of conduct, segments of which are brought into play by innumerable specific acts (property). Thus the law generally, or segments of it (civil, criminal, domestic relations, etc.), is a vast congeries of patterns through which run the outlines of a master-pattern. No person and no other institution escapes contact with these basic functional patterns of law and property.

Geography enters in because all organized institutions have a geographical center of dominance which usually has some physical

implementation such as a capital, shrine, office, or other structure. All institutions, including functional, usually have definable geographic bounds and ecologically determined centers of dominance. Most institutions are markedly affected by physiographic considerations—particularly if taken over a considerable area and a considerable period of time.

The institution has also an ideological center of dominance. The basic point of departure for institutional ideology is the system of values accepted by the society in which the institution comes to life. This system of values points to the ultimate ends and thus influences the means which can be used. These ends may be formally stated, vaguely implied, or "felt." The place of the system of values in a cause-and-effect picture of institutional growth is indeterminate. Such a system may foster some institutions, be indifferent to others, retard or inhibit others. Likewise, evolutionary forces may generate institutions which will force revision of ultimate value systems. But, at any given time and place, the persons observed are affected by these ultimate values in their conduct and hence in their institutional activity. Within this broad general scheme, each institution carries its own set of values—that is, its end and the means it provides for achieving the end. The end may be a consciously defined one and the institution may have been consciously constituted to achieve that end. Most corporate institutions are of this kind. On the other hand, the institution may have evolved out of the past as an expression of collective feeling or adaptation to a collective or "natural" need. Any consciously conceived end may therefore be a rationalization or implication—an assumption of entelechy. An institution which is of the character of social vegetation—like the family and associated institutions—may be gradually absorbed into the category of institutions whose ends are consciously stated and whose basic patterns are consciously determined (as in enacted law).

VI

As the subject of scientific social analysis, the institutional man is not an individual organism. He is rather an ideal type, a statistical abstraction, an adumbrated pattern of behavior. He cannot

be discovered apart from his institutions—the institutions of which he is a member. He cannot be described except after a careful analysis of the hierarchy of institutional patterns bearing upon his behavior. His significance as a concept lies in the character of the foundation he provides for the institution itself. While it is true that "human nature" is the product of institutions operating upon the human organism, there would be no institution if that organism were not capable of recording and preserving forms of action. For the institution rests upon the physiological imperative for repetition in time (much of it rhythmical). Like the tree or the animal, the human organism is a creature of biological habit whose rhythmical routines lie rooted in nature itself—in the cycles of the sun, the moon, the seasons, metabolism, etc. The intellectualizing of behavior does not escape the physiological base. Subjective activity (fantasy, daydreaming, scientific thought) cannot escape the physiological bonds, cannot wholly free itself from the disposition to habitual repetition. The "scientific attitude" is as much a matter of establishing a habitual mode of response as is the "common-sense" attitude, or any other pattern.[9]

The human clay is living. The potter which molds it achieves a permanence of form which is dynamic, cumulative, itself slowly malleable. The essence of it is form in time though the spatial dimension is inevitably concomitant. Yet the form is not immutable. Aside from whatever changes may be taking place in the potter—the institutional complex—the human organism is subject to the biological laws of growth and their consequent effects upon behavior patterns. Institutions themselves are influenced by the positional distribution of age levels within their hierarchic structures. The institutional man, therefore, is one whose behavior can be recorded, described, and, barring the intervention of unknowns, predicted.

The importance of this concept for social analysis lies in its connotation of the character of human behavior. Institutional behavior is basic; it is more fundamental than rational behavior or emotional behavior. If standards can be set up by which a certain

[9] I bow again to a favorite theme of Veblen's.

category of conduct can be described as nonrational or irrational, the perpetuation of that conduct is institutional. The contrary is equally true. Invention, frequently sporadic—the product of brilliant individual deviations—has been elevated to a systematic rational process. The scientific method has become institutionalized until we expect the "normal" behavior of a scientist (in his science) to be highly rational.[10]

The basic laws governing social action are those of social psychology. All the social studies must start from this point. Social psychology itself must be presumed to have established an integration with biology and physiology. The analysis of an act of an individual must start with the institutional complex of which, for this purpose, he is the center; it will end with the discernible individual idiosyncrasies which had a bearing on the act. (Such idiosyncrasies may be physical or mental or emotional; rational, nonrational, or irrational.) The analysis of a social act likewise begins with the institutional complex controlling the behavior of individuals in the group. It ends with an analysis and evaluation of particularistic differences which may have caused a deviation from expected norms.

It should be emphasized that institutional analysis as here set forth is not intended to be all-inclusive. It has not been intended to exclude or even minimize the importance of biological and physiological factors; the human organism is first of all a biological entity which has certain inescapable ties with the animal and vegetable worlds.[11] Nor has there been an intention to exclude the fruits of physical science, substantively or methodologically, from

[10] Thornton, *op. cit.*, *passim*. Many of the selections in this volume wrestle with the problem of (1) disseminating more effectively the scientific mode of thought among people generally and (2) educating scientists and engineers to apply the objective scientific attitude in responsible positions of social control.

[11] See, e.g., J. S. Haldane, *Mechanism, Life, and Personality* (New York, 1923). He says: "So far as we can at present understand matter, the physiology of death, and that of reproductive and social activity in all their wide ramifications, belong to the physiology of the species. The individual organism, like the individual cell in a complex organism, belongs to a wider organic whole, apart from which much of its life is unintelligible" (p. 94). On the side of physiology see Charles M. Child, *Physiological Foundations of Behavior* (New York, 1924).

its contributions to the understanding of social conduct.[12] Man lives in a physical world as well as in a biological one; he is weight, mass, and motion; he is conditioned by and makes use of the objective factors of cause and effect found in the physical world. The intention has been to deal with that area of the conduct of the human organism which is peculiar to human society—institutional behavior—and to suggest, it is hoped, a fruitful approach to the study of social behavior.

Analysis of the institutional complex is in constant process. Social scientists are perpetually at work upon it. On a large scale the complexities are overwhelming. The accurate identification of institutional dominants in their proper time and place relations is of the greatest difficulty. The ultimate synthesis of a general institutional pattern seems, sometimes, beyond the capacity of the human mind. The *sine qua non* of progress in social analysis lies in the adequacy of a frame of reference, the avoidance of excessive descriptive detail, and the possession of insight into principle. To this, the concept of the institutional man may make some contribution.

[12] Parsons (*op. cit.*) has a discussion of methodology in his opening pages as does also Noyes (*op. cit.*). For another pertinent discussion see Frank H. Knight, " 'What Is Truth' in Economics?" *Journal of Political Economy*, XLVIII (1940), 1–32, especially the schematic outline on pp. 26–27.

HICKS AND THE TIME-PERIOD CONTROVERSY

WILLIAM FELLNER AND HOWARD S. ELLIS
University of California, Berkeley

PROFESSOR HICKS has, to quote his own words, discovered an interest theory which fits together the jarring elements of the widely questioned time-period theory and the elements of what he calls the "opposition theory."[1] In the subsequent pages we shall first give a brief exposition of the specific concepts of Hicks's analysis and of the main doctrine which he derives from them. Then we shall attempt to formulate and discuss the main issue which has emerged from the controversy around Böhm-Bawerkian and neo-Böhm-Bawerkian ideas. Finally we shall comment upon Hicks's analysis from the point of view of this fundamental issue.

I

Professor Hicks starts out from the conception of a production plan existing in the minds of entrepreneurs who are establishing or carrying on productive processes. The production plan can be described as a stream of future inputs and outputs in which "an input is merely something which is bought for the enterprise, an output something which is sold."[2] The difference between current output and current input is defined as the "surplus" of the period in question; in Hicks's terminology the difference between the output of a "week" and the input of the same "week" is the surplus of that "week." It must be noted that the current interest charge is not treated as an input, i.e., the service of capital is not conceived of as being "bought for the enterprise" currently, while not only replacement but also net investment is considered input. Furthermore, all charges arising out of past contracts are excluded from current input; interest on the previously invested capital figures merely as one of these excluded cost items, so that the surplus of

[1] *Value and Capital* (Oxford, 1939); see particularly chaps. xiv–xvii.

[2] *Ibid.*, p. 193.

any week can be circumscribed more precisely as *profits of the week minus appreciation occurring during the week plus charges arising out of contracts concluded in past weeks*.[3] Owing to the connotation which the word "surplus" ordinarily carries, it must be sharply emphasized that the expression does not stand here for the current net earnings of an enterprise or for some magnitude uniquely determined by the current earnings of an enterprise. It is necessary to stress this point, since the conclusions of the author are, as will be seen later, determined by this unusual definition of a "surplus."

Hicks defines all terms as planned magnitudes, but the length of the total period to which the plan refers is of no particular significance. The period could be conceived as being of infinite length, if the entrepreneur assumes that he and his successors carry on the same activities under conditions which he can forecast practically "forever." If, on the other hand, he plans to sell the enterprise after a certain number of weeks, then the total equipment of the enterprise becomes, according to Hicks's scheme, the planned output of the future week in question, valued according to the price expected for the equipment.

Difficulty may arise through the fact that entrepreneurial planning cannot in reality be regarded as a determinate procedure. The difficulty is not confined to the problem of the length of the total period, since, whatever its absolute length is expected to be, the inputs and outputs within the period and their time distribution will not be estimated with a high degree of numerical precision. Yet the difficulties connected with the indeterminateness of expectations acquire true significance only in "dynamic theory." If we are concerned with the consequences of a change in the interest rate in an economy which previously has been in equilibrium and which now smoothly adjusts itself to the new rate of interest, we can avoid meeting these difficulties. It is best, then, to assume that the period is of an indefinite length at a given rate of interest; that all planned surpluses would be precisely realized as long as the interest rate does not change; and, furthermore, that the plan will be modified under the impact of a change (say, lowering) of the interest rate and that the new plan which again is of

[3] See *ibid.*, p. 196.

indefinite length will now be precisely realized. These assumptions are perfectly consistent with the Hicksian model; and, in a discussion of the consequences of a *ceteris paribus* change in the rate of interest, more complicated assumptions need not be made. The difficulties connected with the actual indeterminateness of planning do, of course, deserve attention whenever concepts implying expected magnitudes are used outside the framework of "equilibrium theory."

If the nondiscounted surpluses expected for the various subsequent weeks are given, forming a series symbolized by $x_0, x_1, x_2, \ldots, x_\nu$, then the present capitalized value of this stream becomes a function of the rate of interest (i) or of the discount ratio (β), the discount ratio being defined as $\beta = 1/(1 + i)$ in Hicks's terms. Thus the present capitalized value of a given stream of future surpluses can be written as $f(\beta)$, and its "elasticity" with respect to the discount ratio becomes

$$\frac{\beta}{f(\beta)} \cdot \frac{df(\beta)}{d\beta}$$

by the formal definition of the term "elasticity." The expanded formula for this elasticity is given by Hicks as

$$P = \frac{\beta x_1 + 2\beta^2 x_2 + \ldots . \nu\beta^\nu x_\nu}{x_0 + \beta x_1 + \beta^2 x_2 + \ldots . \beta^\nu x_\nu}.$$

This expression is interpreted by the author as the average length of time for which the subsequent so-called surpluses are deferred from the present when the times of deferment are weighted by the discounted (present) values of the respective future "surpluses." Hence Hicks calls the expression the "average period" of the expected stream of surpluses, which easily becomes misleading terminology if careful attention is not paid to its meaning. The term is meant to express the average deferment from the present of the "surpluses" to which that specific entrepreneurial activity will give rise, the surplus of any week being defined in such a way that it is larger by contractual charges (interest, etc.) arising out of the past and smaller by appreciation than the profits earned in the week in question. In fact, the concept must be regarded ac-

cording to its definition proper as the elasticity of the capitalized value of the stream of "surpluses" with respect to the discount ratio. It becomes clear, then, that the term expresses a finite magnitude and that it is one of the possible expressions for the average time distribution of the stream. Obviously, the present capital value of any given stream of future values will, however the single terms are defined, be the more affected by changes in the interest rate (the interest elasticity of the present value of the stream will be the larger), the more substantial the distant terms of the series become as compared with the nearer ones. Whatever the time distribution of a stream may be, if more distant terms are substituted for less distant terms, the interest elasticity of the present capital value must thereby increase. Hence, what Hicks calls the "average period" is essentially the average deferment of the single future "surpluses," as measured by the elasticity of their present value with respect to the discount ratio.

The author calls attention to the circumstance that a change in the discount ratio would affect this average deferment even if nothing happened in the real world as a consequence of this change, and he emphasizes that such changes in the value of P are entirely uninteresting from the point of view of a theory of interest changes.[4] For instance, the average period of a stream of constant size and of indefinite length discounted throughout at a constant rate of interest equals the reciprocal of the rate of interest (i.e., the number of years' purchase),[5] and therefore to say that the average period of such a stream increases when the rate of interest declines is a mere tautology to which no meaning can be attached. Yet Hicks states that the changes occurring in the real world in consequence of a decline of the rate of interest will increase the average period, even if the expression is calculated at a constant discount ratio—say, at the discount ratio corresponding to the original rate of interest. The instrument of Hicks's analysis is not simply the average period but the average period as calculated at a given discount ratio. What is traced are the shifts in the terms $x_0, x_1, x_2, \ldots, x_r$ as a consequence of changes in β, and

[4] See particularly p. 219.

[5] P. 188.

what is eliminated by calculating at a given interest rate are the changes in

$$\frac{\beta}{f(\beta)} \cdot \frac{df(\beta)}{d\beta},$$

which would occur even if the terms $x_0, x_1, x_2, \ldots, x_r$ were kept constant. In other words, it is held that a decline of the rate of interest will lead to a change in these terms which, if the same change (i.e., the same investment) had occurred at an unchanging rate of interest, would have increased the interest elasticity of their present capitalized value.

It must be stressed that the argument established by the author in favor of the doctrine that P as calculated at a given rate of interest will, at least under normally conceivable circumstances, increase when the rate of interest declines does not run in terms of an extension of the plan for a more distant future. Not only does he point out that the durability of the equipment used in the framework of the new plan need not be larger than had been that of the old equipment, but he adds that the technical character of the process added to the old process as a consequence of the fall of the interest rate may, strictly speaking, be identical with the technical character of the old process; and he goes on to show that his doctrine will hold even in such circumstances. The example by which the author illustrates the working of his scheme has precisely the character of a technically identical addition to the old process. We will give a somewhat simplified version of Hicks's example, but it contains the only essential characteristic of the case, and it permits a more direct derivation of another equally important conclusion.

Assume that an entrepreneur has invested Q dollars in a productive process and runs the latter with Q/n weekly depreciation charge. Assume that he is induced by a decline of the rate of interest to start a second process of the identical technical character by investing further Q dollars. Then, of course, owing to the "appreciation," the "surplus" of the weeks in which he invests will become smaller by Q dollars minus the additional interest charge.[6]

[6] With further deduction of the additional net profits in the hypothetical case in which there is no lag in putting the equipment to work. The investment must, of

On the other hand, owing to increased earnings, all later surpluses will increase if calculated at the former rate of interest. "There is absolutely no reason why the new processes should not have identically the same technical character as the old," Hicks states, but in spite of this the average period, the average deferment of the "surpluses," increases, owing to the decrease of the surpluses in the investment week (or weeks) and owing to their subsequent increase. Now, the example on which the working of this tool is illustrated[7] shows that after the occurrence of the new investment the period might very well fall back to the level at which it would have been if the rate of interest had remained unchanged. For, if the new process is of the same technical character as the old, then the time distribution of the now larger future surpluses—profits plus interest—will be the same as that of the old surpluses would have been, as soon as the picture ceases to be distorted by the fact that investment—defined as a negative item of the "surplus"—is undertaken. Moreover, the identical technical character of the new process, or even its identical capital-intensity, are not necessary conditions of such a result.

At the same time, it can be seen from this that the conclusion of the author essentially rests on his unusual definition of the term "surplus." If investment does not diminish the current "surplus" by definition, in other words, if the surplus expresses the earnings of the enterprise in the sense of a difference between current revenue and costs, then the time distribution of the stream of "surpluses" is not altered by a technically identical addition (except possibly for technical rigidities which, as Hicks himself insists, are uninteresting from this point of view).

We shall return to Hicks's analysis after an attempt to characterize and briefly discuss the present state of the controversy under the influence of which the author formulated his concepts and his doctrine.

---

course, not take place in one week and might even begin with some lag, instead of right away. In these cases the respective amounts must be discounted in calculating their effect on the present value.

[7] Hicks's example (pp. 223–24) differs from ours merely in that a small addition to a large number of independent processes is assumed and that each of these processes is assumed to be replaced at regular intervals.

II

Taking account of the process of transformation which the time-period theories of investment have undergone in the course of the controversy,[8] the remaining issue might be thus formulated: Can the transference of resources (labor, land, and capital goods) from the production of consumers' goods (or possibly from idleness) to the production of capital goods—as it is brought about *ceteris paribus* by a decline of the rate of interest—be said to lead to an increase of some average interval of time within which the factor services are transformed into consumers' goods? If the question is formulated this way, certain problems, some of which are of a more "fundamental" nature, acquire the appearance of side-issues, but only because they are essentially subsumed under this particular formulation. Is capital an independent factor of production? Does the fact that capital goods are produced with the help of other capital goods necessarily invalidate the "classical" time-period theories? Is it beside the point that a decline of the rate of interest does not lead necessarily to an increase in the average construction period or average durability of technical equipment? The essential content of the time-period theories could just as well be approached from these questions or from other issues arising during the controversy. Yet it is advisable to start out from a formulation of the question which has a direct bearing on the present stage of the controversy. The problem in the above formulation can be further resolved into the following two questions, each of which must be answered affirmatively if some revised but still meaningful version of the time-period theories is valid: (1) Can economic activity be conceived as a transformation of services "embodied" in capital goods into value of output (ultimately into consumption value) within some definite period of time?[9] (2) If this is so, is the average period within which the services are thus transformed into output value *ceteris*

[8] The polemic literature of recent date is listed in Fritz Machlup, "Professor Knight and the Period of Production," *Journal of Political Economy*, October, 1935, pp. 577–78; and Nicholas Kaldor, "The Controversy on the Theory of Capital," *Econometrica*, July, 1937, pp. 201–2.

[9] Accompanied, of course, by a direct (lagless) transformation of labor and land services into output value in all industries.

paribus inversely related to the level of the rate of interest, taking the average period over all services, direct and indirect?

Arguments against the affirmative answers to these questions involve some repetition of what can be found in various parts of the polemic literature. In spite of this, it is essential to distinguish explicitly the *ex ante* aspects of this problem from its *ex post* aspects. Failure to distinguish between them is a major source of misunderstanding; and a clarification of the matter will at the same time facilitate the appraisal of that feature in Hicks's model with which agreement can be expressed—namely, with the conception that planning periods are of an indeterminate length.

The main propositions of the time-period theories can be contested by pointing out that values "embodied" in wealth *are not* transformed finally into consumers' goods unless capital consumption occurs and that in reality this occurs only in special circumstances and even then rarely affects a considerable portion of the capital stock. Yet Professors Hayek[10] and Machlup[11] were right in pointing out that this by itself is not yet conclusive. The question of whether the constant maintenance and even growth of capital is not the result of an infinite number of independent decisions referring to definite periods of time would still remain open.[12] It is easy, however, to show that this is not the case. We shall proceed at first upon the assumption that production plans are carried out just as they have been set up; and we shall argue that, upon this assumption, it is impossible to establish the concept of a period within which values "embodied" in capital goods are transformed into output value. After this we shall point out that the introduction of a period concept of this nature *via unforeseen change* implies an illegitimate merging of *ex ante* and *ex post* analysis. *Ex ante* plans are for an indefinite future, *ex post* periods are determined by technical rigidities or unforeseen economic

[10] "The Mythology of Capital," *Quarterly Journal of Economics*, February, 1936, pp. 199 ff.

[11] *Op. cit.*, pp. 579–80.

[12] Professor Knight, indeed, argues that the nature of capital maintenance, not merely the circumstance that capital is maintained, is of utmost significance ("Professor Hayek and the Theory of Investment," *Economic Journal*, March, 1935, pp. 77 ff.).

events without any unique relationship to changes in the rate of interest.

As long as any production plan is carried out as it was planned, the original investment and its maintenance cannot be conceived of as resting on *independent decisions*. It is true that constant full maintenance is not typically envisaged in entrepreneurial planning up to some (indefinite) date at which economic change makes the equipment obsolete; yet the case in which complete disinvestment into output might be compatible with set plans is at most an exceptional or a limiting case. This by itself would be quite sufficient to undermine the period conception in its *ex ante* aspect.

Actually, the typical situation with respect to planned maintenance may be characterized as follows: Equipment ordinarily consists of a number of various instruments which have to be employed co-operatively with each other and with other factor services in order to produce output. As soon as equipment is put to work, instruments ordinarily begin to depreciate. The entrepreneur is then faced with the choice of either incurring replacement costs or not replacing and bearing an increase in the running costs per unit of output.[13] In practice it will pay in all cases to have instruments depreciate to some extent before replacement is undertaken—we might say, before the replacement level of the instrument is reached—because single productivity atoms can, for technical reasons, never be replaced alone, a circumstance which has to be taken into account in the original production plan. An instrument may, however, contain certain components which can be replaced with much smaller costs than the instrument as a whole; and, if these components wear out faster than other parts, their replacement level will be reached sooner than that of the instrument as a whole. An instrument may even consist altogether of independent replacement units, in which event there is no such thing as a replacement level of the instrument as a whole. More-

[13] The distinction between replacement costs and running costs is arbitrary in general, because all costs can be viewed as replacement costs of something. But the maintenance costs of any given instrument within a plant are a reasonably determinate magnitude and can be contrasted with so-called running costs. The latter, if also viewed as replacement costs, are the replacement costs of the raw-material inventories, output-commodity inventories, etc.

over, it is important to realize that in case an instrument is defined as a sufficiently large physical unit consisting of numerous instruments in the usual sense, it will always be possible to divide it into several independent replacement units without a residual. More specifically, technical equipment to which some organic production plan refers is almost without exception divisible into separate replacement units and taken as a whole has no replacement level of its own.[14]

The replacement levels of different parts of equipment are always reached—and this fact is known in advance—at different moments of time; if, then, these parts are not replaced, other parts of the equipment become useless. Therefore, the moments of time at which single instruments must be replaced within an assemblage of equipment are fundamentally of no other significance than the moments at which single parts must be exchanged in each instrument. The planned nonreplacement of instruments within an equipment would imply the deliberate scrapping of the entire equipment at some technically determined, but economically meaningless, point of time. In the typical case technically determined oscillations in the level of maintenance of any single equipment will occur, and this is known in advance; but the case in which these oscillations carry the maintenance level down to the zero point at some future moment represents a limiting case which is but exceptionally approximated.

It is, however, much more important to realize that, even when this limiting case is approximated, the length of the period within which such a transformation of embodied values into output value would be planned and realized is determined by technical rigidities and could not be conceived of as being generally regulated by the interest rate. Apartment houses may under certain

[14] Physical units which we would call one instrument in everyday language are usually not divisible into independent replacement units without a residual. But there is, of course, no precision in the use of the term, and, if we choose to call the Golden Gate Bridge or Boulder Dam an "instrument," then such an instrument is divisible without a residual. The argument of the text is merely based on the divisibility of equipment to which a plan refers, whether we call that equipment an instrument, or whether—as is more usual—we say that it consists of several instruments.

conditions approach this limiting case, because a building as a rule cannot be divided into independent replacement units without a residual (it must be rebuilt after some time); and the building itself, the single parts of which are practically valueless after razing, may be by far the most substantial asset of the group of capital goods to which the plan refers. Yet the fact that an apartment house may in this sense have a replacement period of, say, thirty years does not indicate that a decline of the rate of interest will not lead to the building of another asset, which is also exceptional from the same point of view[15] and for which the period amounts to twenty years. The shorter period would not even imply that the depreciation rate is larger than that of the first case. Replacement periods of this character are not determined by the average depreciation rate of all parts of an instrument but merely by the depreciation rate of some part which does not happen to belong to any independent replacement unit. An instrument which is replaced with another one of the same type after twenty years may have a smaller depreciation rate than an instrument which is replaced after thirty years, in case a sufficient number of components is exchanged in more frequent intervals in the second instrument than in the first. Furthermore, even if the depreciation ratio of a more costly instrument is larger than that of a less costly instrument, the former might be preferred to the latter after the decline of the interest rate, because the larger maintenance costs of the more expensive instrument may be outweighed by its greater productivity.

This also can be expressed by saying that in typical cases the life-history of single capital goods does not reflect an investment period in any economically meaningful sense of the word. The period reflected by the life-history of capital goods "is not an interval between production and consumption," as Professor Knight emphasizes;[16] and it may be added that such a period is also meaningless in terms of entrepreneurial planning. Only in

[15] Namely, in that the whole equipment to which a plan refers comes near to having a replacement period of its own.

[16] F. H. Knight, "Note on Dr. Lange's Interest Theory," *Review of Economic Studies*, IV, No. 3 (June, 1937), 227.

limiting cases has a piece of equipment, to which an organic plan refers, a determinate lifetime *ex ante*. And in these limiting cases there is no unique relationship between the rate of interest and this technically determined lifetime.

Hitherto we were not concerned with changes in the production plans. But attention must be devoted at least briefly to a portion of Professor Hayek's argument which would apparently mean that the investment periods become finite as a consequence of unforeseen changes. Since the periods of useful life do become definite intervals of time *ex post*, the embodiment of factor services into capital goods increases the share of utilized services which will be transformed into output value within some finite period and decreases the share transformed into output value "directly" or "without a lag." Hayek seems to argue that, for this reason, investment increases the average period as taken over all services.[17] This argument involves an illegitimate shift from *ex ante* to *ex post* reasoning. *Ex post* we can record only the fact that the capital of most communities is not entirely disinvested after some period of time but, on the contrary, is at least almost entirely maintained, and usually more than entirely maintained. Yet sugar factories may, of course, be replaced by shoe factories, and a new decision has to be made when the shoe factory is built. This is the only reason why the question as to whether the capital of any existing community is invested for some finite interval of time can be raised at all. But the argument must then remain on *ex ante* grounds: the period for which capital is invested in sugar-manufacturing equipment within the framework of a given production plan is typically indeterminate *ex ante*, because the capital value of the equipment is intended to be maintained as long as no change occurs. The interval after which the capital value of a certain sugar-manufacturing equipment is no longer maintained becomes determinate only *ex post;* but at the same moment the interval loses significance for the problem. For, as soon as we record the fact that capital funds are no longer invested in sugar-manufacturing equipment, we shall also have to record that they are—at least partly, but as a rule fully—invested in some other

[17] *Op. cit.*, p. 226; cf. also p. 206.

field. From the point of view of capital theory, a difference exists between the various technical fields merely in terms of planning; apart from this, one dollar's worth of capital goods is simply one dollar's worth of capital goods. Yet an "increase of the length of a *planned* period" loses all meaning when the plan under consideration itself treats the period as indeterminate.

III

It must be concluded from the way in which Hicks constructs his scheme that he also denies the validity of the time-period theories with which we were concerned in the previous section. The stream model itself is said to refer to an indeterminate period of time. A definite termination point may of course be set by the sale of equipment to other entrepreneurs, but the length of this period is not made a function of the rate of interest. It is not, furthermore, assumed that at some future date the maintenance level of the equipment drops to zero; but, if it should do so, this date is apparently not assumed to be related specifically to the rate of interest. Finally, Hicks states explicitly that "there is no reason why that production plan should have any sort of end which is significant for this purpose: inputs are planned to succeed inputs; outputs, outputs, just as far ahead as the entrepreneur cares to look."[18]

The question then arises in what respect the theory goes beyond these negative propositions. The answer is that Hicks pretends to a synthesis whereby some sort of finite deferment in connection with investment activity may still be retained in a revised theory of capital. The doctrine that the average deferment of the stream of surpluses—as measured by the elasticity of their capitalized value with respect to the discount ratio—is inversely related to the level of the interest rate represents Hicks's formulation of the idea which he accepts as correct from the time-period theories. Böhm-Bawerk, he adds, has unfortunately so stated the doctrine as to refer only to a special and very unrealistic case within the general theory as presented by himself.

Hicks's main thesis, however, is merely a consequence of the

[18] Hicks, *op. cit.*, p. 218.

definitions which he employs. The surplus is so defined that investment in an enterprise must under all circumstances decrease the current surplus, while it must under all circumstances increase later (expected) surpluses. Hicks's so-called "surpluses" of an enterprise (profits minus appreciation plus charges arising out of the past) essentially indicate nothing other than *those amounts by which the entrepreneur's assets outside the enterprise are expected to increase (or by which his liabilities are expected to decrease) owing to the fact that he undertakes productive activities during that week.* If the entrepreneur undertakes no activities whatsoever during a week, his surplus amounts to zero, and his assets outside the enterprise decrease by the amount of the charges arising out of the past. In case he does undertake entrepreneurial activities during the week and "earns" only the charges arising out of past contracts, without earning profits, but also without incurring depreciation, the surplus amounts to the charges which he "earns"; and at the same time it is by this amount that his assets outside the enterprise are larger (or his liabilities are smaller) than they otherwise would be. If over and above the charges arising out of the past he earns profits, then these must be added to the charges arising out of the past in calculating the surplus; the resulting amount again will indicate by how much his assets outside the enterprise are larger than they would have been if all activities had been discontinued for the week, unless the profits reflect themselves in appreciation within the enterprise. Yet, since appreciation must finally be subtracted in calculating the surplus, this latter qualification does not affect the outcome. It might be added that appreciation may simply reflect the investment of funds into the enterprise during the week, instead of reflecting undistributed profits. In calculating the Hicksian surplus, it still remains an item of subtraction, and, of course, it remains an item of subtraction also in calculating the effect on the assets outside the enterprise.

Current "surpluses," if defined in this way, must be diminished —other assets must decrease or liabilities increase—when investment is undertaken, just as expected future surpluses must increase (it must be expected that other assets become larger or

liabilities become smaller than they would be in future weeks had no activities been undertaken and if only the charges arising from investment had been carried). This circumstance in and of itself increases the average deferment of "surpluses" as measured by the elasticity of the present capitalized value with respect to the discount ratio; and the final outcome can be different only if this effect is offset by some other circumstance. The only conceivable offset would be a simultaneous substitution of near-future surpluses for distant-future surpluses amounting to disinvestment in the near future, attending the investment effect appearing in the present. Under the usual continuity assumptions regarding decreasing returns, this cannot be expected as the consequence of a decline of the rate of interest; as, indeed, Hicks himself proves.[19] Hicks, therefore, holds that in normally conceivable cases the fact that a decline of the rate of interest brings forth investment can be expressed by saying that there will be an increased average deferment in a series of terms so defined as to decrease when investment is undertaken and to increase when additional profits and interest are earned. Obviously, the only position this implies as to the facts is that *ceteris paribus* a decline of the rate of interest brings forth investment!

Hicks's concept refers to single firms, or rather single plans, only; but it may be pointed out that for all firms taken together (excluding banks) the total realized surplus of a week would mean the amount by which their total liabilities are smaller actually than they would have been had their activities been discontinued for that week. Again it is obvious that investment, amounting itself to a decrease of the current surplus, must be expected to lead to an increase of surpluses for the indefinite period of time for which the investment is maintained. Because Hicks does not make it explicit, we are obliged to repeat again from Section I that the time distribution of his own "surpluses" need not change permanently! When investment has been completed and the new equilibrium corresponding to a lower interest rate has been reached, the time distribution of the new future surpluses could, for anything in Hicks's scheme, be identical with the distribution

[19] *Ibid.*, pp. 221–22.

of the original stream. During the interval of adjustment, the length of which depends upon the mobility of the system, the Hicksian "surpluses" of the present and the near future are diminished by the value of the funds to be invested.

In simpler terms, net investment is the production of non-consumed wealth, leading to an increase of the stream of consumable wealth for an indeterminate period of time. The first part of this statement can be expressed as an excess of input over output, the second part as a subsequent excess of output over input, if investment is, according to Hicks's practice, defined as input and interest as output. Finally, since capitalized values of infinite future streams are finite magnitudes and since the interest elasticities of these capitalized values express in a sense their time distribution, all this can be translated into the terms of a finite "average deferment" of "surpluses," defined *ad hoc*.

Yet why should it be? Why should the facts that all firms in the aggregate increase their liabilities or decrease their liquid assets when they invest and expect to earn interest on their investments be expressed with the apparatus of time periods from artificially defined "surpluses"? What becomes of the supposed synthesis? The author raises the question himself and gives this answer:

> The justification for what we have been doing (even if it is a little pointless in itself) lies in the present state of capital theory: we can not hope to banish the spectre of Böhm-Bawerk (so far as it needs to be banished) until we have explained where he went wrong. I do not think it possible to do this with less elaboration, if we are to do justice to the perfectly sound element in his theory. . . . .[20]

But Böhm-Bawerk and his successors, if any real issue is involved, maintained and maintain that real surpluses—that is, the net yield of capital goods—had a distribution over real time, functionally dependent upon the rate of interest. Is justice done this position by transforming it into a truism by the device of artificial *ad hoc* definitions of surplus and period?

[20] *Ibid.*, p. 224.

FLEXIBILITY OF CHEESE PRICES

JULES BACKMAN
New York University

ALTHOUGH it is not stated in so many words, the implication of Mr. Nicholls' study[1] is that the increasing concentration in the cheese industry has resulted in "growing inflexibility of prices during the post war period." This article will undoubtedly be cited as a case study supporting the widely held belief that price inflexibility is largely due to concentration of control. An examination of the available evidence, however, indicates that the price of cheese is relatively flexible rather than inflexible as he suggests.

The explanation for this inconsistency is found in the inadequate test—namely, "frequency of change"—used to determine price flexibility. Although frequency of change has been shown to have a high degree of correlation with the amplitude of change,[2] it cannot be used as a sole test of price inflexibility. As Dr. Means has admitted, "relatively infrequent price adjustments could give the degree of flexibility necessary to the performance of this balancing function."[3] Nourse and Drury have also stated that they regard "frequency of change . . . . as a fictitious and misleading test of the soundness of price adjustment."[4] Frequency of changes reflects the type of market in which a good is bought and sold and not the inflexibility of its price.

Price inflexibility is more appropriately measured by the extent of price change rather than by how frequently it changes. Two types of inflexibility may be noted: secular and cyclical. Secular flexibility refers to the responsiveness of the price of a commodity to all the influences which affect its demand or costs over the long run. Technological change, economies, plant capacity, and status of competitive

[1] William H. Nicholls, "Post War Concentration in the Cheese Industry," *Journal of Political Economy*, December, 1939, pp. 823–45.

[2] G. C. Means, "Industrial Prices and Their Relative Inflexibility," *Senate Doc. 13* (1935), pp. 3–4, and E. S. Mason, "Price Inflexibility," *Review of Economic Statistics*, May, 1938, pp. 63–64.

[3] G. C. Means, "Big Business, Administered Prices, and the Problem of Full Employment," *Journal of Marketing*, April, 1940, p. 375.

[4] E. G. Nourse and H. B. Drury, *Industrial Price Policies and Economic Progress* (Brookings, 1938), p. 9.

products are among the more significant factors affecting the long-run price. The extent to which reductions in cost, for example, are reflected in a lowering of price would indicate its flexibility. Cyclical flexibility, on the other hand, refers to the responsiveness of the price of a good or service to general impacts such as monetary changes; in other words, the extent to which a given price conforms to changes in the general level of prices. When a price declines less than the average it may be considered inflexible, while changes equaling or exceeding the average indicate flexibility. Since adequate data to measure secular flexibility are not available, the studies to date have been concerned with cylical flexibility of one kind or another.

But if we are, in fact, to measure cyclical inflexibility, then the periods studied should cover recognized business cycles—not arbitrarily selected years. On this basis price changes between 1926 and 1933 would have little significance; the more appropriate measurement would be from 1929 to 1932 or 1933.[5] Furthermore, the extent of price change should be measured not only on the decline but also in periods of advances. It is desirable, if possible, to measure these changes over a period covering more than one cycle in order to insure that the change recorded in a given period did not merely reflect an unbalance in the base period. Thus if the period 1929–39 is divided into three periods—two declines (1929–32 and 1937–August, 1939) and one advance (1932–37)—and the price of a given product moves less than the average in each period it can be considered as inflexible.[6]

The above comments indicate why Nicholls' procedure of dividing the twenty-one-year period, 1918–38, into three-year periods has little significance for a realistic measurement of inflexibility of cheese prices. But, more important, the study itself contains data which indicate the inadequacy of using frequency of change as a measurement of inflexibility. Thus while the author on pages 836–37 purports to present evidence of "growing inflexibility of prices" a chart on page 835 conclusively shows that in the most "inflexible" period (1936–38), as

[5] The low point in the annual average for the B.L.S. wholesale price index was reached in 1932 while the low point in the monthly average was in February, 1933.

[6] It is desirable to allow some leeway. Thus a product whose price was within 10 per cent of the average decline could be considered as flexibly priced. For a statistical study of the flexibility of commodities included in the Bureau of Labor Statistics wholesale price index in the three half-cycles from 1929 to 1939 see Jules Backman, *Price Flexibility and Inflexibility* ("Law and Business Series, Contemporary Law Pamphlets," Ser. 4, No. 3 [New York: New York University, 1940]).

measured by frequency of changes, prices declined from about 17½ cents in 1937 to 10 cents in 1938. If consideration is given to the fact that "in the late summer of 1938 new rules of trading on the Wisconsin Cheese Exchange were set up . . . ." and the decline before that change is measured, then the low point was still below 12 cents. The decline of 40 per cent compares with a decline of slightly more than 10 per cent in the Bureau of Labor Statistics wholesale price index in the same period. Furthermore, the approximate ranges of prices indicated on the chart for the years 1936–38 were as shown in Table 1. Certainly a price with these wide fluctuations cannot be called inflexible.

TABLE 1

1936	18 –12½
1937	17½–14½
1938	16 –10

That cheese prices have been flexible from the period 1929–39, as well as in the three years noted above, may be easily illustrated. While the prices reported by the Bureau of Labor Statistics are not identical with those quoted on the Wisconsin Cheese Exchange, they do give some indication of the changes in cheese prices.

TABLE 2

Period	Average Change	
	Cheese (Per Cent)	B.L.S. Index (Per Cent)
1929–32	−46	−32
1932–37	+47	+33
1937–August, 1939	−20	−13

The average change recorded by the three cheese prices[7] included in the Bureau of Labor Statistics wholesale price index in the three half-cycles from 1929 to 1939 together with the change in the Bureau of Labor Statistics index are indicated in Table 2.

[7] The B.L.S. quotes prices for whole-milk cheese, American twins, Chicago (B.L.S. Code No. 86), Wisconsin daisies, fancy, fresh, New York (B.L.S. Code No. 87), and California flats, fancy, old style, San Francisco (B.L.S. Code No. 88).

Since the price of cheese[8] fluctuated more than the average price level in each of these three periods, it seems clear that it was flexible and not inflexible as indicated in Nicholls' study. While no evidence is presented as to whether the price of cheese was still more flexible in the years prior to 1929, it may be noted that in the 1929–32 period the decline exceeded the average by slightly less than 50 per cent, while in the 1937–39 period the average decline was exceeded by more than 50 per cent.[9]

The data presented by Nicholls indicate that the industry is highly concentrated. If it can be assumed that the prices quoted are reflected in the quotations for the products sold by the large companies, then this is a situation in which concentration of control is accompanied by price flexibility. But since the evidence is not conclusive that the price data and the data relating to concentration refer to the same products at the same stages of production, this conclusion should not be accepted without reservations.

[8] A similar fluctuation was recorded in the price of American cheese (twins) on the Wisconsin Cheese Exchange where the price declined 51 per cent from 1929 to 1932, then advanced 60 per cent from 1932 to 1937 and declined 18 per cent from the latter date to August 1939. See *Wisconsin Dairying, Bull. 200* (Wisconsin Crop and Livestock Reporting Service, 1939), p. 59, for monthly prices from 1910 through 1938 and U.S. Department of Agriculture, Agricultural Marketing Service, for prices in 1939.

[9] For those who feel that frequency of change is an adequate test of flexibility, it may be noted that a recent study classified cheese prices as one of the most flexible as measured by frequency of change (see National Resources Committee, *Structure of the American Economy*, June, 1939, p. 189).

EXTENSIVE EXPANSION AND POPULATION GROWTH

ALVIN H. HANSEN
Harvard University

PROFESSOR HAROLD L. REED'S note in the April, 1940, issue of the *Journal of Political Economy* contains in very compact form a number of very good points, and in general the argument is incisive and penetrating.

The point about saving and housing in a stationary population is especially interesting. The same idea had only recently occurred to me. It appears highly probable, as Professor Reed states, that the increased savings which almost certainly would follow from smaller families—a point which, however, is denied by many[1]—would probably encourage more home ownership, and since resident ownership means usually better homes, this would involve a larger per capita investment in housing. While I think this point is sound, I question very much that there is any high probability that the resulting increase in per capita housing investment can offset the decline in total housing incident to a stabilization of population growth.

The point, however, to which I wish especially to call attention is the statement on page 247 with reference to the effect of the continuation of former rates of population growth upon the attainment of full employment. Here a footnote reference is made to my opinion which involves, I think, an incorrect reading of my presidential address. Frequently an author has the experience of being quite surprised at the interpretations that others make of what he has said, and if he is honest, at times when he re-reads his own statement, he discovers that he inadvertently has put the matter in a manner which justifies the interpretation made. In this case I went back and read my paper again, and I am not able to see that the interpretation indicated in the footnote is justified. Had it been my purpose to show the

[1] Sometimes the argument is made that married couples desire fewer children in order to enjoy a higher level of consumption for themselves—e.g., buy a car. This, of course, is true. But this does not prove that the total family consumption is therefore more than would have been the case had they had many children. The parents are indeed able to enjoy a larger consumption for themselves if the family is small, but they will also be able to save more. I think any statistical inquiry will show that, given the same income, a family with fewer children saves more than a family with many children. A small-family couple can not only buy the car which the large-family couple cannot afford, but it can afford a life insurance policy and a better home in addition.

effect of population growth alone upon unemployment, I should have called my paper "Population Growth and Unemployment." On the contrary, it was my purpose to integrate population growth intimately with the other factors making for expansion, including territorial expansion and technological progress, and so I tried to tie population growth in very closely with these other factors.[2]

Indeed, I said quite categorically on page 2 that "it can scarcely be questioned that a continued growth of population at the rate experienced in the nineteenth century would rapidly present insoluble problems."[3] This, of course, is due to the fact that we no longer have the rapid extensive expansion territorially throughout the world that we formerly had. The important thing to note is the decline in extensive expansion which involves both population growth and territorial expansion.

I started my discussion with an analysis of Adam Smith and stressed the point that he integrated population growth with the other factors in economic progress and said at the close of this paragraph:

> If we wish to get a clear insight into the economic consequences of the current decline in population growth, it is necessary to return to the suggestion of Adam Smith and to explore more fully the causal interconnection between economic progress, capital formation and population growth.

In the succeeding paragraph reference was made to the expanding economy of the last century which involved both population growth and territorial expansion. Again, on pages 8, 9, and 10, I discussed the intimate connection of population growth with the opening of new territory and the discovery of new resources. I discussed the impact of technology itself upon the opening of new territory and the growth of population in the nineteenth century and showed that the latter two factors are now rapidly passing, and that we have to rely more exclusively upon the technological factors alone. Again on page 11 toward the bottom of the page I integrated the cessation of population growth with the disappearance of new territory for settlement and exploitation.

In the discussion of the widening of capital (pp. 8–9) I attempted to isolate the capital formation incident to population growth from that due to other factors. It cannot be assumed, however, that the amount

[2] I have called Professor Reed's attention to this matter, and he very generously concedes that he had made the footnote reference from memory, that his original understanding had been correct, but that in the meantime he had presumably reinterpreted my statement as a result of secondary references.

[3] *American Economic Review*, March, 1939.

of capital formation attributable to each would have been the same had the other factors been lacking. I concluded (p. 9) that the "development of new countries was indeed so closely intertwined with the growth of population that it would be difficult to avoid double counting." Reference was then made to the new capital formation going into the western frontier and the foreign investments of England and France. There then follows the statement:

> These figures, while only suggestive, point unmistakably to the conclusion that the opening of new territory and the growth of population were together responsible for a very large fraction—possibly somewhere near one-half—of the total volume of new capital formation in the nineteenth century.

With respect to the 1930's it seems probable that the combination of the decline in population growth,[4] particularly the slow rate of growth in our urban communities, plus the failure of the development of large new industries, was of great importance, but again one cannot consider the population factor alone. With respect to the future, important new industries are of course likely to develop as in the past, but the combination of the decline in territorial expansion and the decline of population growth will together present a new situation—one never before experienced during the last two hundred years.

In general it is the decline of extensive expansion that must be stressed, and I think that some such title might better have covered the subject matter of my paper. I am not able to see how anyone can doubt that extensive expansion will play a smaller role in the future. The question then resolves itself as follows: Can intensive expansion develop sufficiently to take up the investment slack? It seems to me—and this is also the opinion of Myrdal in his recent book on population[5]—that the decline of extensive expansion itself makes intensive expansion more difficult. This, however, does not imply an inevitable impasse. Adjustment to the diminished rate of expansion is possible, and it becomes the problem of economic policy to ascertain how far this adjustment may be expected to take place automatically and how far deliberate action is required, and of what character (monetary policy, fiscal policy, cost-price policy, etc.), in order to achieve full employment and thereby the higher standard of living which a cessation of population growth per se presents as a realizable possibility.

[4] It is important to note—a point which I have continually stressed—that it is the *absolute increment* of growth that is significant *not the percentage rate of growth*. This also holds with respect to the "acceleration principle" in business-cycle analysis.

[5] Gunnar Myrdal, *Population* (Cambridge, Mass.: Harvard University Press, 1940), p. 150.

BOOK REVIEWS

What Is Liberty? By DOROTHY FOSDICK. New York: Harper & Bros., 1939. Pp. x+194. $2.00.

This is a scholarly and well-written book. More important, it presents a treatment which is in general penetrating and sound—with an exception of especial interest to economists—of one of the most crucial concepts in social discussion. It seems absolutely essential to any analysis of social problems that is to lead to anything but confusion that the notion of liberty or freedom be restricted to its primary meaning of the absence of coercion or interference by other persons in the activities of an individual in doing what he wants to do and possesses the means, personal and external, for doing. In the correct usage, liberty need not lead to good results or to any results at all. It will of course be devoid of content wherever there is either no wish to act or no power to act. (The author's distinction between internal power and external power or means seems spurious to the reviewer, more misleading than valuable, since internal power is also chiefly an artificial product of the individual and of social forces.) The confusion of freedom and power is surely one of the most common and pernicious fallacies in political discussion.

But ambiguity and question-begging by no means end here, as our author effectively brings out. Freedom is very commonly identified outright with any set of conditions or type of institutions which a particular writer is trying to advocate or to promote on the ground that they make possible, or will in fact (as he alleges) lead to, "the good life"; it is even identified with the good life as such, in practically every definition of that "weasel" expression. Quotations are multiplied in this book—and from famous authors—in which freedom is said to mean private property and socialism, self-expression and self-repression or self-sacrifice, obedience to law and absence of all law, equality, security, and "goodness." It even specifically means "prohibition" and military conscription. It may mean wanting what one gets as well as getting what one wants, and doing what one is told or abstaining from action, as well as doing what one wants to do. Moreover, and in particular, freedom is very commonly made to mean authoritarianism,

specifically in the forms of communism, Roman Catholicism, and fascism, and even Teutonic-Aryan racialism. Proponents of all these systems use the same logic, and, naturally enough, practically equivalent language (see Index, *s.v.* "Church, Roman Catholic"; "Maritain, Jacques"; "Communism"; "Fascism"; "Marxism"; "National Socialism"). The author does not discuss any of the world-religions by name, as definitions of freedom, which is somewhat strange in the case of Buddhism in particular; and Stoicism is not mentioned by name, though Epictetus is quoted several times.

Moreover, the same author will frequently use the term "liberty" or "freedom" in numerous contradictory senses (see Index, *s.v.* "Dewey, John"; "Laski, Harold").

All this is very well done indeed, in the reviewer's opinion—though the distinctions could perhaps be made and kept more clean cut at points. But when we reach the last chapter, which is entitled "Fundamental Liberties" and deals with dictatorship in relation to cultural and economic liberty, a different judgment must unfortunately be rendered. In stating the contrast between these two forms or fields of liberty the author indeed shows exceptional insight in recognizing that "economic" activity is only in part "economic," being largely an end in itself rather than a means to the production of goods. But in dealing with the problems of economic freedom, which is to say, the general problem of its replacement by governmental action, she exhibits the familiar blind spots of the contemporary man in the street. She interprets the traditional liberal conception of liberty in this sphere as "full liberty for all to do as they like" (pp. 164–65) with no reference to the vitally important condition of "free" mutual consent in all transactions, which has always been an integral part of even the most extreme laissez faire position. (We pass over other conditions and restrictions which were also universally recognized.) The chapter contains the familiar references to inequality of [bargaining] power (pp. 169, 179), which of course has no reality in a competitive market. (Bargaining is possible only where there is monopoly on both sides.) Guaranteeing minimum wages is assumed to be a matter of making laws prohibiting employment at a lower figure. Political control over the employer is supposed to involve no real issue except depriving him of the "enjoyment" of "exerting arbitrary control over his employees" (pp. 171–72). Government must as a "major necessity . . . . develop new forms of communal ownership and control giving to men who work on 'collective jobs' rootage in a vocation they can call their own with avenues for initia-

chances of further progress. The progress comes from the savings of the rich (Mr. Snyder tends at times to forget the savings of corporations, while elsewhere he stresses them), which, if dissipated, would be spread so thinly among millions of poor that the latter would have but a pittance more to spend and would spend it.

Agriculture produces little wealth. (Naturally, since it produces mostly for immediate and rapid consumption.) Manufacturing and mining are the great producers of wealth.

Per capital wages in this country have risen almost precisely with capital invested. The " 'expropriation' of Labor by the Capitalistic System has been on the order of less than 1 percent per annum." (Meaning, probably, 1 per cent on capital investment.) "This 1 percent, added to the realizable minimum interest rate, is what has created the hundred billions and more of industrial capital now employed in industry in the United States."

Where the lot of the lower income classes is concerned, we find cold-blooded dialectics of a Ricardian ferricity; when the taxation of, or other threats to, higher incomes are discussed, emotional words like "outrageous" and "scandalous" occur. The only explicit, outspoken indictment of business intelligence is of statistico-economic ignorance! It comes in a footnote to a chart on page 279, where we read that "no one has a larger ignorance of the reasons for these variations in product, and thereby in profits" than the industrialist and enterpriser. Obviously the Pareto curve contains *implicit* indictments of many an entrepreneur.

Mr. Snyder envisages the time when, "by the unbelievably simple methods of credit control, ... we shall have no more business depressions, nor crazy speculation, nor wide unemployment and decline in the production of wealth."

Through the text are scattered forty-four charts, most of them of considerable interest, most of them concerned with long-time trends, and most of them not related to the text where they occur.

Even if one did not know Carl Snyder, one could tell from the chapter headings alone how much he has enjoyed writing this book. He must have enjoyed penning all those verbless "sentences." It is unfortunate that a work that could have been an effective counterpoise to some of the "new economics" did not turn out as a more cogent and balanced presentation of the sounder theses of the book.

F. E. Richter

New York City

A History of Economic Thought. By ERICH ROLL. New York: Prentice-Hall, Inc., 1939. Pp. 430. $3.00.

In a splendidly written volume which does signal honor to its author, already favorably known on this side of the Atlantic for his penetrating writings, Professor Erich Roll, of the University College of Hull, England, has brought fresh and unhackneyed treatment to the history of economic doctrine.

Obviously intended for perusal more by the student than by the layman, the book is designed to serve as an introduction to contemporary theoretical activity. In this respect it strikes a happy balance between the elementary survey of his distinguished fellow-countryman, Professor Gray, and the comprehensive text of Professor Haney. Eight chapters, entitled respectively "The Beginnings," "Commercial Capitalism and Its Theory," "The Founders of Political Economy," "The Classical System," "Reaction and Revolution," "Marx," "The Transition," and "Modern Economics," carry the reader in approximately four hundred pages from Old Testament times to the contributions of Pareto. A concluding chapter touches briefly upon the extent to which the heritage bequeathed to the contemporary generation of economists by Marshall, the Austrians, and the Lausanne School has been cared for and refined. Allusion is made to a few of the host of recent and present-day scholars, among them Wicksell and Pigou. The theory of monopoly and imperfect competition and the theory of crises are declared to be the two most important theoretical developments attributable to the younger economists. Professor Roll closes on a lofty note with an appeal for "combined resistance to those forces which would abuse modern economic theory by turning it to reactionary purposes, which would enthrone the omnipotent state, itself a creature of sectional privilege, under cover of a 'neutral' economics." The alternative, as he sees it, is that "robbed of a foundation of political philosophy on which (however illegitimately) it had based itself, economics is in great danger of becoming a plaything of demagogy."

A policy of rigorous selection and concentration has of necessity led to a virtual omission of any discussion of the works of American writers. Of Commons, Fetter, Henry George, Patten, and Walker there is no mention whatsoever. Carey, J. B. Clark, Davenport, Fisher, Benjamin Franklin, F. H. Knight, Seligman, and Taussig are referred to in passing.

Within the limits set by himself, however, the author has performed his task in a notably painstaking and workmanlike manner.

Meticulous industry and acute thought are in evidence on nearly every page. Urbanity of style is joined to balanced exposition and appraisal. Of engaging and at times original portions the reviewer has most of all been struck by the discussion of bullionism versus mercantilism, the recognition of Petty as the most important of the forerunners of Smith and Ricardo, the analysis of Malthus' attack upon the accumulation theory of Ricardo, and the generous attention given to socialist criticism in its relation to economic thought.

Professor Roll has dealt only with those doctrines which are habitually included under the head of "professional economics." To that end he has confined himself mainly to wide questions of economic scope and method, to the relations between economics and politics, and to the position in social change which economic theory has occupied over the course of centuries. Well documented throughout, here indeed is rich fare, not alone for specialists in pure theory but for all who are interested in the sweep of economic thought and opinion.

JOHN M. FERGUSON

University of Pittsburgh

Local Economic Effects of a Large-Scale Industrial Undertaking. By BØRGE BARFOD. Copenhagen: Einar Munksgaard; London: Oxford University Press, 1938. Pp. 74. 3*s*. 6*d*.

This is a brief but significant contribution to the rapidly accumulating statistical literature on the "multiplier." The author, a member of the research staff of Aarhus Oliefabrik A/S, attempts to evaluate the total effect of his firm's operations upon income and employment in the local community.

Three elements are comprised in this total:

a) "Direct primary income"—the firm's pay roll less the income its labor force would receive from other local employment or insurance if the firm closed down.

b) "Indirect primary income"—that part of the firm's local nonpay-roll expenditures which is "precipitated" as local income at once.

c) "Secondary income"—the sum of an infinite geometric progression of "re-precipitations" from total primary income. It is estimated that 46 per cent of income received re-enters the local income stream at each round, while 54 per cent leaves the community.

The "multiplier," which is the ratio of the sum of all these to the sum of the first two, is calculated as 182 per cent. A lower figure than those generally estimated for public works expenditures in a national economy is to be expected, since the "leakage" to other areas from a small community is relatively important.

Thus the author arrives at an admittedly rough estimate of the total effect of his firm's operations upon the income of the community. The measurement of the employment effect is still less definite, since the employment multiplier depends on the elasticity of employment in retail trade with respect to the volume of trade, and that elasticity is presumably smaller in the short period than over the long run.

The author's discussion of the issues is illuminating and his technique sufficiently ingenious to extract the maximum of information from the available data. One wishes he had taken space to explain whether certain of his data were based on surveys or on out-and-out guesses; and the time element is inadequately analyzed. If the oil works pay roll were, say, to cease entirely, both the primary and the secondary effects might be quite different for the immediately subsequent period than for the long run.

There is another possibly important gap. If the presence of Aarhus Oliefabrik encourages the location of some other enterprises in the community (for instance, by furnishing materials or complementary labor), then its total effect may be much larger than its own local expenditures would indicate.

This study, despite its limitations, deserves attention from theorists, statisticians, specialists in industrial location, and—perhaps one may add—from chambers of commerce. It should be particularly useful in connection with compilations of local balances of payments.

EDGAR M. HOOVER, JR.

University of Michigan

Money in the Law. By ARTHUR NUSSBAUM. (Published under the auspices of the Columbia Council for Research in the Social Sciences.) Chicago: Foundation Press, Inc., 1939. Pp. xxxvii+534. $7.50.

Professor Nussbaum, up to 1933, was a Berlin barrister and a professor of law at the University of Berlin. Since 1934 he has been a visiting professor of law at Columbia University. While abroad he had written extensively on varied subjects, particularly on the law of

money. His present book is the first to be written and published in this country which deals comprehensively and understandingly with the law of money.[1]

The author, believing that the "basic monetary problems of developed economic systems are substantially the same throughout the world," has employed the comparative method in analyzing and determining the principles underlying the law of money. Emphasis, however, is placed on American monetary history and law. The first third of the book deals with general legal aspects of money and particularly with the concept of the monetary unit and with kinds of money and monetary systems. The second two-thirds of the book deals with many phases of the problem of debts, such as the effect on debts of fluctuating currencies, exchange control, and gold, commodity, index, and multiple-currency clauses. Of particular current interest is the chapter dealing with foreign-exchange control. The author discusses the effect of such control and the problems arising therefrom both in the country imposing it and in foreign countries, and describes the cases and difficulties arising under clearing agreements and other international agreements on exchange control. The consequences of German foreign-exchange control are most extensively treated. However, judicial and administrative decisions of many countries, arising out of foreign-exchange control, are cited and discussed.

Especially complete is the lengthy chapter dealing with gold clauses. This subject at present is largely of historical interest in this country.[2] Professor Nussbaum's citation and analysis of court decisions and legislation from a great number of countries amply sustain his view (p.

[1] In the latter part of 1938 there was published in London F. A. Mann's *The Legal Aspect of Money*. That book is devoted primarily to a discussion of the English law on the subject. The author acknowledges his particular indebtedness to Professor Nussbaum "who by his indispensable treatise [*Das Geld* (1925)] as well as by many other publications dealing with various monetary problems paved the way for further research to a greater extent than any of his contemporaries." *Past and Present Facts about Money in the United States*, by Paul Bakewell, Jr. (New York, 1936), expounds the thesis that Congress once having fixed the metallic content of the dollar is thereafter constitutionally prohibited from varying its content. The same novel monetary theory forms the basis of a lawsuit which Mr. Bakewell brought against the United States on a liberty bond. The suit was dismissed by a federal district judge in St. Louis (28 F. Supp. 504) and the dismissal was affirmed by the Eighth Circuit Court of Appeals (110 F. [2d] 564). The United States Supreme Court denied certiorari (60 S. Ct. 1081).

[2] Outstanding gold-clause provisions were struck down and their future use prohibited by the Gold Clause Resolution of June 5, 1933. Most of the litigation involving this problem has now been concluded.

373) that "Creditors imposing gold clauses upon their debtors seek to dam their rights against the trend of events. The dam ordinarily will stand a while. In the long run, however, or under extraordinary circumstances, the levelling force of economic change will prove stronger." It will be recalled that gold-clause obligations were sustained by courts in this country during and after the Civil War even though there was a great disparity of value between gold and paper dollars. Although apparently agreeing with the conclusions of the majority of the Supreme Court in the famous gold-clause cases decided in 1935, Professor Nussbaum is highly critical of the process of reasoning embodied in the opinions of the Chief Justice. With some of these criticisms one may differ. The author also observes that the "language and tone of the *Perry* case [involving a liberty bond] more than other decisions of the same period, challenge the legislative and executive branches of the Government," and that those decisions of the German courts dealing with the mark during the period of the inflation clearly reveal the "danger inherent in the democratic form of government, that the judiciary may overstep its boundaries" (p. 369).

Elsewhere in his book, Professor Nussbaum states views which may be questioned. He says (p. 189) that the President's power to revalue the dollar is limited to fixing its weight between 50 and 60 per cent of the old gold content of the dollar, and therefore the "administration cannot lower the price of gold appreciably despite an undesirable afflux to the United States of this metal." He adds that "if this ratio under the pressure of inflowing gold is to be shifted in favor of the dollar, it can only be done by Congress." Professor Nussbaum does not refer to the provisions of Section 8 of the Gold Reserve Act (U.S.C. Title 31, sec. 734) which authorize the Secretary of the Treasury, with the approval of the President, to buy gold at home or abroad "at such rates and upon such terms and conditions as he may deem most advantageous to the public interest."

Professor Nussbaum is unduly troubled by the inscription which appears on silver certificates issued in 1934 and thereafter. He construes the inscription to permit the redemption of such silver certificates in subsidiary silver coin as well as in standard silver dollars. The practice of the Treasury Department has always been, upon request, to pay silver dollars to holders of silver certificates. Furthermore, the old statutory provisions relating to the redemption of currency of the United States have lost much of their significance since the passage of the act of August 27, 1935, which entitles the holders of all United States moneys "to exchange them, dollar for dollar, for other coins or

currencies which may be lawfully acquired and are legal tender for public and private debts."

The inclusion of the section on "multiple currency clauses" in the chapter on "foreign currency debts" instead of in the chapter on gold-clause obligations foreshadows Professor Nussbaum's view that the Gold Clause Resolution of June 5, 1933, was inapplicable to obligations containing multiple-currency clauses. The Supreme Court recently resolved a conflict in lower court decisions and held the resolution applicable to such obligations.[3]

Professor Nussbaum has a very interesting discussion of what he calls the "indirect currency power of Congress." He says (pp. 208–9), "What seems not to be so remote, however, is the assumption by Congress of legislative power over *deposit currency* and particularly over check accounts, inasmuch as the check device has particularly profound repercussions upon the currency." He points out that a number of state banks are not reached by existing federal legislation and raises the question "whether Congress may extend general deposit regulation to this group." He states (p. 210) that "it is not likely that a vigorous states' rights attitude will determine the views of the Court in monetary cases," and (p. 211) that "in the banking field, too, the trend towards nationalization is so powerful that it is bound to have its repercussions upon legal thought."

The book is written primarily for the lawyer and the judge and is not intended as an economic or monetary treatise, although it does contain some material on monetary theory. The lawyer and judge should find the book a great aid in dealing with problems relating to the law of money, as it contains critical analyses of great value and is a veritable storehouse of learning, legal precedents, and authorities. The book should also prove useful to economists and other students and specialists in the field of money and finance in their consideration of the legal consequences of, and measures which people take in an effort to protect themselves against fluctuations in the domestic purchasing power and foreign-exchange value of currencies, foreign-exchange control, and the sequestration of foreign-exchange assets.

BERNARD BERNSTEIN

Treasury Department, Washington, D.C.

[3] *Guaranty Trust Co.* v. *Henwood; Bethlehem Steel Co.* v. *Anglo-continentale Treuhand*, 307 U.S. 247, 265 (1939). In these cases the bonds were held by Americans or by foreigners who acquired the obligations from Americans after the passage of the Joint Resolution.

Commercial Banking Reform in the United States: With Especial Reference to the 100 Per Cent Plan and the Regulation of Interest Rates on Bank Deposits. By LEONARD L. WATKINS. ("Michigan Business Studies," Vol.VIII, No. 5.) Ann Arbor: Bureau of Business Research, School of Business Administration, University of Michigan, 1938. Pp. 133. $1.00.

An "impartial" analysis of the so-called 100 Per Cent Plan, to which Part I (pp. 1–70) of this study is largely devoted, is certainly most desirable, and Professor Watkins is a scholar whose theoretical and practical insight into banking fully qualifies him for a contribution free from propagandistic tendencies. Unfortunately, from the outset a dose of misunderstanding is injected into the discussion by the author's classification of banking systems into three categories: traditional commercial banking, nationalization of the credit-loaning function, and the 100 Per Cent Plan. This serves to confound two entirely different problems, namely, that of fractional versus 100 per cent reserves, on the one hand, and the problem of private versus public credit management, on the other. From the point of view of pure logic, contrasting "concrete" with "concave" could scarcely be more confusing. Governmental banking or capital lending is compatible—as a matter of principle—with the fractional reserve system as well as with its opposite; consequently, the 100 Per Cent Plan is not "intermediate in character between self-regulation and outright nationalization" (p. 11) as the author contends. The emphasis, for example, that "control over the volume and allocation of loan funds is given by nationalization and not by the 100 Per Cent Plan" (p. 62) is incomprehensible, because its implication is to charge the plan with a shortcoming which, if correct, could be dealt with within its framework in the same fashion as in any other banking system.

In the reviewer's opinion, it is to Dr. Watkins' credit that he does not devote more than a few pages to the technicalities of the 100 Per Cent Plan. The claim of the plan to fulfil the objectives of eliminating the expansion and contraction feature characteristic of the fractional reserve system, and of stabilizing the business cycles, is denied forcefully (pp. 35, 49 ff.) but with the arbitrary admission that "it should be easier" under the plan to offset variations in the volume of investments. The author's conclusion is (pp. 55, 61 ff.) that the trend is "inescapably in the direction of greater government control over the whole banking mechanism," which is indicative of his own predilections as well. They are clearly formulated at the end of Part I: "The

suggestion that monetary control in the future may be attended by a larger participation of the Government in lending, as an adjunct of control over the quantity of money and of the rate of Government spending through public works and the like, is thus made with full recognition of the difficulties involved." It is not clear how the "fully recognized" difficulties would be eliminated, but the further suggestion is added that "a program of public works be formulated for booms and depressions." Moreover, the maintenance of the presently prevailing regulations "which apply at the various points of commercial banking operations" (p. 55), supplemented by deposit insurance (p. 48), is advocated. As to quantitative control, Dr. Watkins takes it for a fact that "the monetary supply can be controlled within a reasonable range of fluctuation by existing mechanisms, and . . . . the authorities can (at present) probably make as large a contribution to economic stability as monetary management permits" (p. 37).

Of course, a believer in such a managed system in which present-day "free banking" and deposit insurance would be maintained, with a thoroughgoing quantitative and qualitative control superimposed and a great deal of government banking added, has little patience with any idea of an automatic monetary structure. Accordingly, the idea that gold standard and liquid banking could provide an automatism is (pp. 32 f.) briefly dismissed; the type of 100 Per Cent Plan—proposed by Henry Simons—to create a new automatism is barely registered. On the other hand, Dr. Watkins does not seem to feel that the combination of diverse systems (including "the present system of piecemeal regulation and diffused control" [p. 27]), against each of which a great deal of criticism is waged by himself, might combine the shortcomings of each rather than its advantages. Nor has he apparently any doubt about the wisdom and integrity of a monetary and banking management supplied with widest discretionary powers. Thus essential problems of financial control which the discussion of the last decade has brought to the fore are clouded rather than brought to new light, while others are presented and criticized with a clarity and consistency which give the pamphlet a scientific and literary status of its own. This is particularly true of the discussion devoted to certain aspects of the 100 Per Cent Plan, such as its lack of a definitive objective, the futility of its claim to redistribute bank profits or to inhibit excessive public spending (pp. 38 ff.), etc.

The same holds, in the reviewer's opinion, for the second part of the study, dealing with "The Regulation of Interest Rates on De-

posits." It provides perhaps the best historical survey of deposit-rate policies in this country, together with useful statistical comparisons and supplemented by a cautious attempt (pp. 114 ff.) to appraise the role of the deposit rate as a factor in general credit policy, such as with respect to bank liquidity and solvency, and of credit control. The discussion of this last point suffers, however, from the author's apparent desire to disregard the prevailing "cheap money" system and to appraise the value of deposit-rate regulation for credit control in terms of its subordination to a flexible discount-rate policy.

MELCHIOR PALYI

Chicago, Illinois

Macro-dynamic Aspects of the Equation of Exchange. By ERLING PETERSEN. Oslo: I Kommisjon Hos Jacob Dybwad, 1938. Pp. 116.

This interesting monograph is well worth the careful attention of monetary theorists. Scholarship, good sense, and rigorous analysis are combined in consideration of some of the basic problems of monetary theory.

Dr. Petersen confines his analysis to the "industrial circulation" (monetary transactions in goods and services) as distinct from the "financial circulation" (monetary transactions in money claims). The Schumpeter equation of exchange for all income transactions is related to the Fisherine equation of exchange for total transactions, and then written in the form of a "double" equation of exchange for the entire industrial circulation. This double equation of exchange is then expanded to take account of such concepts and magnitudes as the volume of consumers' goods, investment goods bought for income, and intermediate goods (p. 33), production, unit cost, unit profit, employment (p. 36), income produced, income paid out, and income spent (p. 37), saving and investment (pp. 38–39, 77), rates of replacement of inventories (pp. 44 ff.), the relation between the velocity of goods and the velocity of money (pp. 50 ff.), the income velocity and the transaction velocity of money (pp. 62 ff.), and circulating cash and surplus cash (pp. 66 ff.). The double equation of the industrial circulation and its constituent terms are conveniently summarized (pp. 95–99), and an appendix presents an approximation to the statistical measurement of the factors in the equation for the industrial circulation.

Dr. Petersen criticizes the concept of velocity of circulation of goods and says that "little is gained and much confusion can be caused" by

the use of such a concept (pp. 10–11). More attention to the problems summarized in that concept, however, would have prevented him from repeated identification of the volume of production and the volume of trade (pp. 32–33, 36, 81). The statement (p. 38) that "income produced can only differ from income spent by changes in the stocks of final goods" is open to question. The distinction between circulating cash and surplus cash, though useful for some purposes, often leads to confusion. The statements (p. 74) that "surplus cash balances . . . . may be viewed as factors in a pseudo-creation or pseudo-destruction of money" and that "the increase in the surplus cash . . . . of consumers . . . . will have just the same effect on circulation as a decrease . . . . in the amount of money" detract emphasis from the fact that the phenomenon of the increase in "surplus" cash is essentially a decrease in velocity of money. The three price-level concepts which Dr. Petersen introduces, the price level of all commodities in the industrial circulation, the price level of income goods, and the price level of intermediate goods, are much like the price-level concepts in Keynes's *Treatise* and are subject to similar limitations. More attention might well have been paid to the plurality of price levels and to the differentiation of cash balances.

The general tenor of the monograph, however, is excellent. Emphasis is placed upon the really significant aspects of monetary theory, namely, the determination of prices by the mutual impact of flows of money and streams of goods and services per unit of time, analysis of monetary influences upon prices and quantities in terms of the appropriate equations of exchange, and use of the great body of analysis and description which lies behind these equations of exchange.

JOHN K. LANGUM

University of California

Financial Questions in United States Foreign Policy. By JAMES W. GANTENBEIN. New York: Columbia University Press, 1939. Pp. xiv+264. $3.25.

The modest purpose of this book, as stated in the Preface, is "to furnish brief summaries and analyses of several of the more important groups of financial matters of an international character to which the United States Government is being called upon to give consideration." The subjects considered are exchange control, stabilization funds, war

debts, defaults on foreign dollar bonds, double taxation, and government assistance in financing foreign trade. Expropriations and other actions taken by foreign governments injurious to American direct investments are not discussed, nor is the silver policy of the present administration.

The book will be useful principally as a college text and as a handbook for busy government officials and editorial writers. In it they will find much pertinent information skilfully arranged, with frequent citations and copious quotations from government documents and standard secondary works. For the research worker and the thoughtful citizen who wants to know the factors which have influenced government policy and the reasons why one policy and not another has been chosen the book will be less satisfactory. Arguments are presented pro and con but the author has refrained from probing beneath the surface in order to examine the merits of opposing views. Recognizing the evils arising from the concentration in the United States of the bulk of the world's gold, he yet sees no necessity for a modification of our gold policy. "It may be assumed," he says, "that more settled conditions abroad will in time result in a return to foreign countries of at least a part of the funds placed in this country for safe keeping .... and for investment, and this may cause a gold outflow of several billion dollars" (p. 59). The outbreak of war in Europe a few months after this was written would seem to make the automatic reversal of the gold flow somewhat dubious.

The traditional policy of the United States government with respect to defaults of foreign governments on dollar bonds is described as noninterventionist—"the matter is primarily one for negotiation between the parties at interest"—but the author fails to mention the recent negotiations between our government and that of Brazil, in which the latter agreed, after a credit from the Export-Import Bank had been arranged, to resume payment on its dollar bonds. The discussion of the work of the Export-Import Bank illustrates how gingerly the author touches upon controversial issues. It is a significant fact that practically all the major transactions of the bank have had political or semipolitical objectives. Yet it would be difficult for the uninformed reader to deduce this fact from any of the author's statements.

PERCY W. BIDWELL

Council on Foreign Relations
New York City

The A B C of the Federal Reserve System: Why the Federal Reserve System Was Called into Being, the Main Features of Its Organization, and How It Works. By EDWIN WALTER KEMMERER. 11th rev. ed. Princeton: Princeton University Press, 1938. Pp. x+292. $2.50.

The publication of an eleventh edition of Professor Kemmerer's *The A B C of the Federal Reserve System*, first published in 1918, is sufficient evidence of its wide popularity. While the author is a proponent of so-called "quantitative" control of the supply of "bank money," his book is nevertheless so definitely tainted with the contrary attitude as greatly to detract from its value in the opinion of one who, like the reviewer, believes that the doctrine of "qualitative" control is almost wholly fallacious.

The reviewer would agree with many of Professor Kemmerer's comments on legislative enactments of recent years; but not with statements in praise of the actions of the Reserve system during the autumn of 1931 (pp. 129, 155, 157–58); nor with the implied approval of the prohibition of the payment of interest on demand deposits as a means of preventing "destructive competition" (p. 197). There is urgent need for recognition of the difference between the problem of monetary policy, which is a matter of the aggregate of the circulating medium, and the furnishing of services to the customers of the banks. The former calls for deliberate control by a central monetary authority; the latter, for competition, so long as we make any pretense of trying to operate an economy of free enterprise. To claim, with approval, that the contractibility of Federal Reserve notes was "established" in 1920 is to give praise where only criticism is in order (pp. 126–27). Bank credit is always contractible—with disastrous results.

The first part of the book is very useful as a source of information concerning the notions on banking reform that were current before the passage of the Federal Reserve Act; and the latter part is equally useful as a convenient summary of recent legislation.

LLOYD W. MINTS

University of Chicago

Farm Mortgage Loans of Life Insurance Companies. By ARCHIBALD M. WOODRUFF, JR. ("Williams College David A. Wells Prize Essays," No. 7.) New Haven: Yale University Press (published for Williams College), 1937. Pp. xii+204.

The purpose of this book is to answer two questions:

"(1) Under what circumstances were farm mortgage loans of life insurance companies made?

"(2) How have they survived the economic crisis and depression following 1929?" [p. 1].

Mr. Woodruff's essay will be very useful to future students of the great depression when they come to consider the accompanying upheaval in the debt system. He has chosen to define his subject so narrowly as to give himself little room for economic interpretation. His work, furthermore, having been in process from early 1931 into 1937, has some of the defects of a contemporary document; and he has wisely refrained from trying to project trends. But he has done a very handsome job in bringing together scattered and elusive materials. While his printed sources will largely be accessible to his successors, at least if they make use of his excellent Bibliography, few of them will have the advantages—of which Mr. Woodruff has made full use—of his five summers in the field during the critical period and of the contemporary interpretations he was able to secure from the men who were handling the insurance companies' farm-mortgage loans. Insurance reports tend to be full of rather incomprehensible dry bones; and those who have to reconstruct the animal called a "predepression farm mortgage" will find this careful and yet lively picture enormously helpful.

ALBERT GAILORD HART

Iowa State College

On Agricultural Policy, 1926–1938. By JOSEPH S. DAVIS. Stanford University: Food Research Institute, 1939. Pp. viii+494. $3.00.

In this sizable volume the director of the Food Research Institute has assembled thirty-three addresses, papers, and chapters, or liberal extracts from the same, that he has produced in the thirteen years ending in 1938 on subjects mainly concerned with agriculture and agricultural policy. Many of these are available elsewhere, but it is a convenience to the student, and must have been of great satisfaction to the writer, to have them all carefully printed under one cover. Included in the collection are Dr. Davis' presidential address on "Statistics and Social Engineering" before the Statistical Association in 1936, and portions of a general lecture on "Economic Planning" delivered to a student group at Stanford University. The most interesting document of all is his address in August, 1938, on "Agricultural Problems and Policy" before the Republican Program Committee.

Few readers of this *Journal* will need to be told of the high virtues of much of the discussion and analysis in these pages. Words are care-

fully chosen, and facts, figures, and footnotes are presented with meticulous precision. Almost any subject introduced is surrounded with important relevant circumstances and conditions. Dr. Davis is master of the manner of writing that social scientists aspire to under the designation of "objective." The reviewer might, it is true, list a number of points on which the weighing-in of other considerations leads him to somewhat differing conclusions, but surely this is not the point of view from which a semiautobiographical attempt of this sort should be examined. Instead it should be looked into as a human document tracing the reactions of a particular scholar with a given intellectual and spiritual equipment and background to the developments of the period in question.

The high point in Dr. Davis' career as mentor on public policy for agriculture, it will become apparent to one who catches the spirit concealed in his words, was the passage of the Agricultural Marketing Act in 1929, with its provision for the federal farm board which he had been advocating, and his accepting the role of economist for this board. It is clear that he was under no delusion as to important deficiencies in the act and in the plan for administering it; but he was hoping that the members of the board would proceed with care and deliberation. A year and a half after the act was passed he was still a little hopeful, as one may judge from the paper on "The Program of the Board." He was ready at this date to accept the need for some procedure for keeping production within bounds. "Surplus prevention is fundamental to surplus control" (p. 159). But he offered no procedure for it. The drastic methods embodied in the Agricultural Adjustment Act were not to his liking, and he was ready to have them discontinued after two years as emergency measures that had already done what little they could to relieve the plight of the farmers. He rejoiced at the decision of the Supreme Court in the Hoosac Mills case. The subterfuges and divagations of the subsequent legislation and administration naturally disturbed him greatly. The language of the later addresses and excerpts loses much of even its apparent objectivity, and such phrases as "bungling official management" and "blundering policy-building" begin to stand forth. It is plain that government from Farm Board days on failed to perform as rationally as he had hoped, and that as a consequence he inclined increasingly toward the "imperfect yet less blundering operation of economic forces."

One would err, nevertheless, in describing Dr. Davis as a laissez faire economist. On another occasion he placed himself, and properly,

together with the reviewer and Dr. E. G. Nourse, as "belonging in the large group of those who endorse neither extreme laissez-faire nor extreme governmental control or operation."[1] Just where between these extremes he belongs, however, is not made very clear. Some of his statements are rather close to one of the extremes, but others surely not. Time and time again he indicates a willingness to have government exercise a considerable measure of control, but only after "searching examination" of the problem. This reviewer wonders if he has not an unwarranted confidence in the ability of economists by any manner of research to find the answers to many of our most perplexing questions, and whether a program for agricultural reform that would meet his specifications as "sound" would not be "rational" only in a society of unreal people and institutions. Surely, also, the "clear eyes" with which he would have us see the problems of the day would have to be his particular eyes to satisfy him. Finally, it is to be doubted if any economist of this day is as nearly free from bias or prejudice as the person whom he repeatedly introduces to his audience as a "friendly critical analyst" (pp. 431–32).

JOHN D. BLACK

Harvard University

Agriculture in Modern Life. By O. E. BAKER, RALPH BORSODI, and M. L. WILSON. New York: Harper & Bros., 1939. Pp. vii+303. $3.50.

In these days of the circumambient Mr. Dies and an over-all "propensity to discover propaganda" whether it exists or not, it perhaps will not be remiss to point out by way of beginning that the modest title of this book is but the "front" for a "testament of agrarian fundmentalism" that is definitely polar. Mr. Baker and Mr. Borsodi, particularly, have assembled an impressive array of "facts" calculated to bolster up a set of firm convictions on the all-inclusive "good" of the agricultural "way of life."

All three of these men are acutely aware of a crisis in American life. Each in turn refers to the impact of science upon Western culture and particularly upon agriculture. All are in essential agreement that certain elements from the agrarian culture of the past ought to be preserved if democracy is to survive. Differences among them are principally quantitative (as to just how much of this agrarian culture should

[1] *Three Years of the AAA* (Brookings Institution, 1937), p. 480.

be preserved), though as between Baker and Wilson the difference is really great.

Baker, student of population and land statistics in the U.S.D.A., believes that the cultural, spiritual, and physical health of any society depends upon the proportion of its population engaged in agriculture. Agriculture is God's way of life. Only the farmer obeys the divine admonition to "be fruitful and multiply." Only among farm peoples can the basic social unit—the family—retain its hold on the individual.

In order to survive, the farm family must have land of its own. But, little by little, farmers have been losing their land. The reason is urban domination. Cities are barren. They do not maintain themselves. More and more they decimate the countryside by luring away the farm boys and girls; more and more they have acted to loosen family ties by gaining control of the land, separating those who remain from ownership.

With a smaller proportion of farm people in the whole population, the haunting specter of a falling birth-rate has reared its ugly head, promising to reduce still further the prospective demand for agricultural products and to intensify still more the crisis in rural life.

Probably the one institution which can help most in revivifying national life is the church. Farm people must be made conscious of their divine mission. Like the Amish, they would do well to insulate themselves against the decadent sensateness of the cities. Government should take steps to reverse present trends, either by encouraging decentralization of industry or by sponsoring greater self-sufficiency within the farm family itself. However, we must preserve the illusion among farm peoples that they are doing this thing themselves—that it is democratic.

Borsodi's position is not essentially different from that of Baker. As director of a project dedicated to more self-sufficient living, and as a prolific writer and lecturer about the experiment, he has something a bit more concrete as a basis for his special pleading than has Mr. Baker. As an accountant, Mr. Borsodi is convinced that the extreme specialization and division of labor which characterize industrial capitalism have resulted in greatly increased distribution costs—costs that more than offset the savings from specialized production. He holds that the creation of time, place, and ownership utilities does not constitute production, and he does not see, or chooses to ignore, the blind alleys up which this view leads him.

The farmer, he maintains, has lost most by specialization. One by

one he has surrendered part of the production process to the cities and towns in order to concentrate on producing only raw materials. Distribution costs have gone up and up until now he would be better off, from a purely economic point of view, to go back to satisfying more of his wants directly. Farm people should know the truth in this whole matter; they need to be told how they have been fooled by the economists. But Mr. Borsodi would rather the government didn't tell them. That, apparently, would be government interference with Mr. Borsodi's business.

Compared with Baker and Borsodi, Undersecretary of Agriculture Wilson is a paragon of objectivity. By profession an agricultural economist, Mr. Wilson has acquired in recent years a keen interest in the study of cultural anthropology—the relation of man, his ideas and ideals, to the total environment, material and cultural. Ideas change but slowly. Social problems arise, he believes, when men fall out with their environment—when they fail to assimilate it into an integrated ideological system. Under the impact of science and technological change, the physical universe (and even man's knowledge of his own processes) has undergone radical alterations within the last few generations—alterations which the mind of man (conditioned through previous centuries of life in close communion with organic nature) has not yet assimilated, perhaps cannot assimilate for years to come. Wilson, however, is unwilling to take the "road back" with his coauthors. While there are many aspects of the self-sufficient type of life that are attractive, there are also the costs and unpleasant sides. He recalls that not all the associations of his own farm background are happy ones.

His is the middle way—the golden mean of Aristotle. It is true that up to now scientific and technological advances have redounded chiefly to the advantage of the cities and of large-scale commercial farming. But more recent advances—the small tractor, electrical appliances, hybrid plants—have been equally to the advantage of the small-scale, family-size farm. This age of science may yet come to the aid of the subsistence or partially self-sufficient farm unit, making it possible to preserve the social stability furnished by the old peasant way of life (which may even be the "good life"), at the same time securing the advantages, the comforts, and the conveniences (yes, and the enlightenment) of modern times to this hitherto neglected group. At least, it is a realm in which a government can afford to experiment. Meanwhile, the process of assimilation can proceed with some likeli-

hood, eventually, of realizing a new and more fully integrated culture centered around the achievements of science.

Less spectacular than the others, Wilson appears convincing and essentially sound in his moderation—even in his optimism. He offers no particular doctrine, no dogma. He doesn't know what is good for a sick society. He merely wants to find out. His approach is that of trial and error—the experimental method. Not so with Baker. He feels that something very definite has gone out of our national life. He thinks he knows what it is. He doesn't even share the mild doubt of the poet who lamented:

> I sometimes wish that God were back,
> In this dark world and wide;
> For though some virtues he might lack
> He had his pleasant side.

Since Mr. Baker specifically injects ethics into the discussion there is, perhaps, little point in questioning his objectivity. One can merely speculate on the general acceptability of the means he has chosen, even granting his ends. Societies are rarely reintegrated around outmoded symbols; leastwise not in their original form.

Mr. Borsodi's cause is perhaps a bit more tangible than Mr. Baker's; but one isn't quite sure whose cause it is. In his assault upon modern industrial society he is not always too careful what missile he throws, so long as it appears to serve his purpose.

ALVIN E. COONS

Iowa State College

Financing Government. By HAROLD M. GROVES. New York: Henry Holt & Co., 1939. Pp. xvi+777. $3.75.

Instructors in public finance will heartily welcome the appearance of this distinctive and notable work by Professor Groves, especially as it comes in a field of economics in which, until recently, there has been a scarcity of important texts. While the book is dedicated to the author's students at the University of Wisconsin, in recognition of their assistance, it is also intended for the use of public officials, scholars, and the lay public. We are cautioned in the Preface, however, not to forget that the first objective is that of meeting the needs of students and that, in consequence, the highest effort has been made to give a clear and comprehensive exposition of the subject. This objective has not prevented the author from making a rigorous analysis of

controversial issues or from presenting his own views with candor when debatable questions have been examined.

In arrangement the book marks a notable departure from established custom. Following Part I, which consists of a single chapter on the "Historical Development of Public Finance," the author proceeds at once to a consideration of "Public Revenues" in Parts II and III, thereby postponing his treatment of "Public Expenditures" to Part IV. Part V is devoted to the subject of "Public Borrowing" and Part VI to "Problems of the Fiscal System" as a whole. Of the dozen or more recent books in public finance which come to the mind of the reviewer, there is only one in which the subject of public expenditures does not precede that of public revenues, namely, the *Principles of Public Finance*, by Hugh Dalton. The justification given for this reversal in order is that the most challenging problems are in taxation rather than in expenditures, while at best it is true only in a superficial way that "governments, unlike individuals, spend their money first and raise it afterwards." Though somewhat at the sacrifice of logical procedure, the author has succeeded to an admirable degree in interweaving problems with the principles of taxation. If the mind of the student can be stimilated with problems before the keen edge of his interest is dulled by theoretical abstraction, there will be the greater gain.

There are two features of the book that are deserving of special attention. It is, in the first place, thoroughly modern in tone and in point of view. The reader is impressed with the fact that, in the mind of Professor Groves, problems of consumption and distribution are of compelling significance in economics rather than those of production. Less emphasis is attached to prevailing theories which have been derived by deductive analysis than to the broad aim of government to increase the social welfare. For example, one of the major factors to be weighed in choosing sources of revenue is the effect on the productive capacity of a nation (p. 29), but we read also, as an argument in support of the ability-to-pay principle, that "production is limited by consumption rather than the reverse, which has hitherto been widely thought to be true" (p. 40). Hence there may well be concern over production on the ground that taxes may deplete purchasing power and, through a decline in consumption, effect a curtailment in the production of goods. Again, a bold program of government expenditures is sanctioned as necessary to provide full employment. The government must "underwrite the economic expansion of the future" (p. 739). Such a program should not be financed, however, by incur-

ring deficits. It may be financed, at least partially, through the enlarged income-tax base which will result from public expenditures that are, if not self-liquidating, at least reproductive in character.

In the second place, as will be seen from the foregoing discussion, Professor Groves stresses the importance of institutions as motivating forces in our economic life. The institutional background, we are told, is a factor which must be taken into account in determining fiscal policy, for at all times "public finance institutions have been conditioned by the prevailing economic institutions" (pp. 21 and 23). Taxation for nonfiscal purposes is defended with the assertion that it may be essential to social regulation and that it cannot always be differentiated from measures which are purely fiscal. The prevailing theory of incidence is criticized because of its atmosphere of unreality, based as it is upon the marginal analysis of prices. Orthodox value theory is undergoing modification in the light of recent explorations in the realm of monopolistic competition. Furthermore, the author holds that most American writers have not drawn clear lines of distinction between the effects of taxes and their incidence.

While a few criticisms of the work might be offered, these are largely of a minor character, and the merits of the book far outweigh incidental criticism. It is written in a natural and easy style. Footnotes are plentiful, and suggested sources for further reading are usually to be found at the end of chapters. There is an abundance of tables, charts, and diagrams to enliven the discussion. It should receive wide acceptance as a text and as a valuable addition to the literature of public finance.

TIPTON R. SNAVELY

University of Virginia

The Financing of Institutions of Public Instruction in Germany, 1927–1937. By FLETCHER HARPER SWIFT. ("European Policies of Financing Public Educational Institutions," Vol. IV: "Germany"; "University of California Publications in Education," Vol. VIII, No. 4.) Berkeley: University of California Press, 1939. Pp. xviii+349. $3.00.

The study is a part of a comprehensive program for the investigation of European practices in the financing of education made under a grant from the General Education Board. The subject covered in this volume, however, is more comprehensive than the title indicates, for

it deals not only with the financing of education in Germany during the decade beginning with 1927 but also with the organizational aspects of the modern German educational system. The report, therefore, is of as much interest to students of education as to students of public finance.

The study presents first a general description of the social and political factors that affect educational policies in Germany. The organization and administration of education in Prussia under the Weimar Constitution are next described. A chapter is devoted to the place of the various levels of government in the financing of education. The main body of the report is then organized as a treatment of the financing of the various kinds of education—the elementary schools, middle schools, secondary schools, and institutions of higher education.

The author presents data regarding income and expenditures classified on a variety of bases. Administrative regulations touching the financing of the German schools are described in great detail. The treatment throughout the text is entirely objective and factual, some ninety tables being required for the presentation of the statistical data. Only briefly in the Preface does the author venture to draw conclusions with respect to the application of his findings to American practices. Here he seems to betray a sympathy for the German policies and to be less critical of them than might have been expected. Not only does he fail to point out emphatically any shortcomings of the German system but the virtues he praises would appear in some respects questionable to many Americans.

Professor Swift's analysis of the financing of education in Germany was made under numerous difficulties. Fluctuations in the value of the currency rendered studies of trends almost meaningless, and the data were therefore limited to a single year or a brief period in the late 1920's and early 1930's. A major difficulty was the lack of adequate official statistics.

The financial data presented in Professor Swift's study are of doubtful value for purposes of comparison with the statistics of educational finance in the United States. The system of classifying financial data, which the author perforce adopted from the official sources to which he had access, departs so far from that considered standard in American practice that no valid comparison can be made. Even such a basic concept as the distinction between capital outlay and current expenditure, as understood and followed in the statistics of educational finance in the United States, was not observed in the German data. In his

analysis of trends in the percentage of governmental revenues devoted to education, the author falls into the common error of failing to account for the rapid expansion in the scope of governmental functions in recent years.

Professor Swift's report is not particularly entertaining as reading material but should be valuable for reference purposes. Especially commendable is his retention of the German nomenclature, with adequate explanations in English equivalents, so that a reader with only a moderate knowledge of the German language is able to follow the discussion without confusion. The author's accurate and painstaking description of the organizational aspects of the German educational system is perhaps his major contribution in this work.

JOHN DALE RUSSELL

University of Chicago

The Functions of the Executive. By CHESTER I. BARNARD. Cambridge: Harvard University Press, 1938. Pp. xvi+334. $3.50.

Mr. Barnard has had a distinguished career as an executive both in private and in public enterprise, notably as president of the New Jersey Bell Telephone Company and as relief administrator for New Jersey. Too few successful executives have been reflective about their functions, and one turns eagerly to such a book as a garner of shrewd wisdom and rich experience.

But it soon appears that the book is not what the title would suggest. Mr. Barnard's comments on the functions of the executive are confined to a single chapter of the eighteen which make up the book. Rather he has dealt mainly with the broad, theoretical aspects of organization. Part I deals with the problem of why men co-operate and with the essentials which are necessary in order to make co-operation desirable and worth while. Part II presents a theory of formal organization. A mere mention of the four elements of this theory will indicate on how broad a plane Mr. Barnard has discussed this subject. They are willingness to co-operate; purpose ("A purpose does not incite cooperative activity unless it is accepted by those whose efforts will constitute the organization," p. 86); a system of communication ("The techniques of communication are an important part of any organization and are the permanent problems of many," p. 90); and effectiveness ("The continuance of an organization depends upon its ability to carry out its purpose," p. 91). Among other things, Part III

explores the nature of authority and the reasons why men obey. Even in the part which deals more specifically with executive functions, the longest chapter is devoted to a definition of responsibility in moral terms, which suggests that businessmen operate under a code of morals similar to that which writers like Friedrich and Ridley have been propounding for public administrators. But Mr. Barnard's acknowledgment that the executive is the subject of many varying moral codes is refreshing.

It is, in one sense, noteworthy that a busy man of affairs is concerned with these abstract principles. Some broad statements which we might expect from an academic theorist it is interesting to have voiced by a businessman. Among other things Mr. Barnard appreciates that bureaucracy is not confined solely to governments but operates in corporate, labor, church, and university organizations (p. 159). At another place he comments, "Yet it seems to me to be a matter of common experience that material rewards are ineffective beyond the subsistence level excepting to a very limited proportion of men; that most men neither work harder for more material things nor can be induced thereby to devote more than a fraction of their possible contribution to organized effort" (p. 144). Other inducements besides money, he suggests, are necessary to produce the ideal organization with its requisite degree of co-operative effort. Again, Mr. Barnard concludes, "After much experience, I am convinced that the most ineffective services in a continuing effort are in one sense those of volunteers or of semivolunteers; for example, half-pay workers" (p. 221). And to cite but one more example, there is his generalization, "The higher the position in the line of authority, the more general the abilities required" (p. 222), a conclusion which has been expressed graphically for public works officials in a chart worked out by Clarence Ridley in his *Public Works Departments in American Cities* (1929).

At the same time, these gleanings from Mr. Barnard's experience are tantalizing. The literature of public and private administration is weak in personal accounts by administrators of the problems with which they have had to deal and the methods they used to solve them. There has already been too much broad generalization in this field based upon a priori thinking. There is still a rich opportunity for Mr. Barnard to make a further significant contribution, to supplement this book, which, if it had been written by an academic scholar, might be charged by some with excessive conceptualism.

CHARLES S. ASCHER

Social Science Research Council

Public Policy: A Yearbook of the Graduate School of Public Administration, Harvard University, 1940. Edited by C. J. FRIEDRICH and EDWARD S. MASON. Cambridge: Harvard University Press, 1940. Pp. xiii+391. $3.50.

The Harvard Graduate School of Public Administration has been functioning for about five years. It is well endowed and has used its income to give the best possible training to a small number of carefully selected students. Most of these students have come from responsible positions in the public service, and all have been men who expect to devote their lives to public administration. The instructors include most of the widely known professors of the Harvard departments of economics and government, plus many specialists, drawn from government, industry, labor, and other universities, who have been brought to Cambridge for one or more meetings of the eight seminars now offered in the School of Public Administration.

This book grows out of these seminars. As is stated in the Introduction, it is hoped that this will be but the first volume in a yearbook series, presenting articles on questions of public policy considered in the seminars. In this first volume, three of the eleven chapters were written by professors, while the rest represent outstanding pieces of research work by students in the seminar. It is the understanding of the reviewer that in future years all the papers will not necessarily come from Harvard professors and students, but, presumably, all will deal with problems related to the work in the seminars.

It is a stated major objective of the Graduate School of Public Administration to combine the theoretical and practical points of view and to cut across all the social sciences in dealing with issues of public policy. It is recognized that most scholars can make their best contribution to the solution of a question of public policy by treating the problems involved from the point of view of their specialty, but also that a sound solution can be found only if the contributions of the economist, the political scientist, and the administrator are all taken into consideration and brought together as far as possible. Complete answers are not sought, but it is hoped through research studies of this type to clarify issues and by careful analysis to make contributions to their solution.

This initial volume of those Harvard studies is a testimonial to the high caliber of the Graduate School of Public Administration and the soundness of its approach to questions of public policy. The eleven

articles differ considerably in length and cover a wide range of subjects. Some are devoted to basic theoretical problems, others to specific, practical questions of immediate interest.

To the reviewer the following chapters were the most interesting: "Public Policy and the Nature of Administrative Responsibility," by Professor Carl J. Friedrich, in which the point is made that modern administration necessarily involves a good deal of policy formulation; "Price Policies and Full Employment," in which Professor Edward S. Mason presents the issues which are basic to the development of sound public policies in relation to industrial prices; "Industrial Markets and Public Policy: Some Major Problems," a critical review of the recent literature on industrial concentration and control, which leads Professor Donald H. Wallace to the conclusion that economists still do not have sufficient data to give reliable advice on public policies in this field; "The Budgetary Experience of Great Britain in the Great Depression," by George Jasči, whose thesis is that the greater stability of the British economy during the depression is attributable mainly to the fact that England, through progressive taxation, has diverted a large part of the income from the well-to-do and channels of investment to governmental expenditures for social services benefiting the working classes; "A Study of Labor Market Control," by Robert Frase, in which both England and Germany are cited in support of the proposition that the public employment offices are central to the development of intelligent labor-market controls, going far beyond the functions of placement and unemployment compensation which are still considered in this country the only matters with which these offices should be concerned; and "Social Scientists in the Federal Service," by Lewis B. Sims, a factual survey which gives badly needed information on the employment opportunities for the several kinds of social scientists in the government service. Other readers, however, doubtless will find the other chapters equally, if not, to them, more valuable: "Public Policy of Industrial Control," by A. H. Feller; "The Pricing of Bituminous Coal: Some International Comparisons," by John P. Miller; "The Significance of the Government Trust Funds for Monetary Policy," by G. Griffith Johnson, Jr.; "Some Reflections on the Nature of the Regulatory Process," by Merle Fainsod; and "The Problem of Constitutional Dictatorship," by Frederick M. Watkins. Every chapter is thought provoking, although many readers will not agree with all the conclusions. In its totality this first volume is a

worthy representative of what probably will come to be recognized in future years as an American counterpart of *Schmoller's Jahrbucher* and an improvement thereon.

EDWIN E. WITTE

University of Wisconsin

An Island Community: Ecological Succession in Hawaii. By ANDREW W. LIND. Chicago: University of Chicago Press, 1938. Pp. xxii+337. $3.00.

This work will serve as a valuable introduction to the economic and social structure of Hawaii. It is concerned largely with changes in land utilization since the Western world first came in touch with the islands. A small island community whose natural resources are primarily agricultural, and which is situated far from other sources of raw materials, has either to maintain a largely self-sufficient economy or to export agricultural products in order to obtain imports of manufactured goods. Hawaii has changed in modern times from a condition of self-sufficiency in which only a very limited range of products was available to a condition in which the per capita value of foreign trade is unusually high and a wide range of products is consumed. Since exports are mainly agricultural, and the development of export trade has depended on an increase in the cultivated area of land and in the yield per unit of area, the problems of land utilization are the central problems on the side of production, and land policy and the system of land tenure largely determine the character of the social system.

A feudal land system existed in Hawaii before the westerner came; hence there has been no question of foreign influences eliminating an equalitarian system. However, foreign capitalist interests have displaced domestic feudal power. Mr. Lind shows in a comprehensive survey and analysis that the modern economic and social history of Hawaii includes examples of changes in ownership and control from small units to large units with highly integrated control and management; changes in agriculture from the small unit of operation to the plantation; changes in the land system from feudal tenure to commercial dealings in land; changes in the composition of the population from one race and cultural group to three races and numerous cultural groups; unusually sweeping changes in mortality rates, in immigration, and in sex and age composition; changes in the dominant cultivated crops leading to a large degree of concentration on two export crops;

changes in the political system from independence under indigenous feudal chiefs to incorporation in the second largest continental nation of the world with its seat of government thousands of miles from Hawaii.

One of the most striking facts brought out in Mr. Lind's analysis is the extent to which the development of the islands and their present economic and social structure are dependent on a single tariff wall. The geographical isolation of Hawaii makes this example of the effects of tariffs on location of industry a very spectacular one.

Mr. Lind has produced a competent study which can be read with profit by economists as well as by sociologists. There are occasional lapses into what economists may regard as unnecessary sociological jargon, and the style of the writing could have been improved in places. These, however, are small blemishes in a valuable type of study which could profitably be undertaken in regard to a number of other areas.

E. F. PENROSE

Geneva

The Case against Experience Rating in Unemployment Compensation. By RICHARD A. LESTER and CHARLES V. KIDD. New York: Industrial Relations Counselors, Inc., 1939. Pp. 60. $1.00.

In this monograph (a companion volume to an earlier study[1] presenting the other side of the argument), the authors attempt to show that experience rating in unemployment compensation is undesirable mainly because (1), at the most, it will encourage stabilization of employment only at present levels, leaving a "hard core" of unemployment; and (2) it will not force consumers to bear the "social costs" of unemployment, since this is largely impossible in view of accepted theory on the incidence of the pay-roll tax. While pointing to several weaknesses in the arguments for experience rating, the authors leave themselves open to criticism by taking a rather unrealistic view of the way employers actually respond to the stimulus of a pay-roll tax reduction.

CHARLES A. MYERS

Massachusetts Institute of Technology

[1] Herman Feldman and Donald M. Smith, *The Case for Experience Rating and a Proposed Method* (New York: Industrial Relations Counselors, Inc., 1939).

BOOKS RECEIVED

American Society of Composers, Authors & Publishers. *Second Copyright Law Symposium: The Second Annual Nathan Burkan Memorial Competition.* (New York [30 Rockefeller Plaza], 1940.) Pp. 167.

Balderston, C. Canby. *Wage Setting Based on Job Analysis and Evaluation.* (New York: Industrial Relations Counselors, Inc., 1940.) Pp. 59.

Bow, Frank T. *Independent Labor Organizations and the National Labor Relations Act.* (New York: Prentice-Hall, Inc., 1940.) Pp. xiii+120.

Browder, Earl. *The Second Imperialist War.* (New York: International Publishers Co., Inc., 1940.) Pp. viii +309.

Brown, E. T. *Bread and Power.* (London: William Hodge & Co., Ltd., 1940.) Pp. 278.

Buchanan, Norman S. *The Economics of Corporate Enterprise.* (New York: Henry Holt & Co., 1940.) Pp. xvii+ 483.

Buehler, Alfred G. *Public Finance.* (2d ed.) (New York: McGraw-Hill Book Co., Inc., 1940.) Pp. xx+846.

Carman, Harry J. (ed.). *American Husbandry.* "Columbia University Studies in the History of American Agriculture," No. 6. (New York: Columbia University Press, 1939.) Pp. lxi–582.

Chapman, John M., and Associates. *Commercial Banks and Consumer Instalment Credit.* "Financial Research Program of the National Bureau of Economic Research *Studies in Consumer Instalment Financing*," No. 3. (New York: National Bureau of Economic Research, Inc., 1940.) Pp. xxiv+318.

Ely, Richard T., and Wehrwein, George S. *Land Economics.* (New York: Macmillan Co., 1940.) Pp. xiii+512.

Evans, George Heberton, Jr., with Barnett, George E. *Principles of Investment.* (Boston: Houghton Mifflin Co., 1940.) Pp. vii+225.

Fairchild, Fred Rogers; Furniss, Edgar Stevenson; Buck, Norman Sydney. *Economics.* (Rev. ed.) (New York: Macmillan Co., 1940.) Pp. xxxi+ 828.

Federal Coordinator of Transportation, Section of Research. *Public Aids to Transportation,* Vol. I: *General Comparative Analysis, and Public Aids to Scheduled Air Transportation;* Vol. II: *Aids to Railroads and Related Subjects;* Vol. III: *Public Aids to Transportation by Water;* Vol. IV: *Public Aids to Motor Vehicle Transportation.* (Washington: Government Printing Office, 1940.) Pp.: I, xiv+171; II, x+316; III, iii+330; IV, xi+317.

Froman, Lewis A., with the editorial assistance of Harlan L. McCracken. *Principles of Economics.* (Chicago: Richard D. Irwin, Inc., 1940.) Pp. xii+702.

Gilboy, Elizabeth W. *Applicants for Work Relief: A Study of Massachusetts Families under the FERA and WPA.* (Cambridge: Harvard University Press, 1940.) Pp. xviii+273.

Guthmann, Harry G., and Dougall, Herbert E. *Corporate Financial Policy.* (New York: Prentice-Hall, Inc., 1940.) Pp. xxxii+795.

Hamm, John E. *The English Hire-Purchase Act, 1938: A Measure To Regulate Instalment Selling.* (New York: Russell Sage Foundation, 1940.) Pp. 59.

Harwood, Sumner. *How To Work with People.* (Cambridge: Cambridge Analytical Services, 1940.) Pp. 197.

Haussmann, Fritz. *Die wirtschaftliche Konzentration an ihrer Schicksalswende.* (Basel: Verlag für Recht und Gesellschaft A.-G., 1940.) Pp. xvi+ 435.

Healy, Kent T. *The Economics of Transportation in America: The Dynamic Forces in Development, Organization, Functioning and Regulation.* (New York: Ronald Press Co., 1940.) Pp. xviii+575.

Hunt, Pearson. *Portfolio Policies of Commercial Banks in the United States, 1920–1939.* "Business Re-

search Studies," No. 24. (Boston: Harvard University Graduate School of Business Administration, 1940.) Pp. v+58.

Innis, Harold A. (ed.). *The Diary of Alexander James McPhail.* (Toronto: University of Toronto Press, 1940.) Pp. xi+289.

International Institute of Agriculture. *World Trade in Agricultural Products: Its Growth; Its Crisis; and the New Trade Policies.* By L. B. Bacon and F. C. Schloemer. (Rome, 1940.) Pp. xix+1102.

Kemmerer, Edwin Walter. *Inflation and Revolution: Mexico's Experience of 1912–1917.* (Princeton: Princeton University Press, 1940.) Pp. xiv+173.

McCarty, Harold Hull. *The Geographic Basis of American Economic Life.* (New York: Harper & Bros., 1940.) Pp. xxiii+702.

Machlup, Fritz. *The Stock Market, Credit and Capital Formation.* Translated from a revised version of the German edition by Vera C. Smith. (New York: Macmillan Co., 1940.) Pp. xii+416.

Meade, J. E. *The Economic Basis of a Durable Peace.* (New York: Oxford University Press, 1940.) Pp. 192.

Mendershausen, Horst. *Four Lectures on the Economics of War.* (Colorado Springs: Colorado College, 1940.) Pp. 47.

Middlebush, Frederick A., and Hill, Chesney. *Elements of International Relations.* (New York: McGraw-Hill Book Co., Inc., 1940.) Pp. viii+498.

Millett, John D. *The British Unemployment Assistance Board: A Case Study in Administrative Autonomy.* (New York: McGraw-Hill Book Co., Inc., 1940.) Pp. 300.

National Association of Assessing Officers. *Equalization Agencies: Sixth Progress Report of the Committee on Assessment Organization and Personnel.* (Chicago, 1940.) Pp. 58.

Pancoast, Elinor, and Lincoln, Anne E. *The Incorrigible Idealist: Robert Dale Owen in America.* (Bloomington: Principia Press, Inc., 1940.) Pp. 150.

Paton, William A. *Recent and Prospective Developments in Accounting Theory.* "Business Research Studies," No. 25. (Boston: Harvard University Graduate School of Business Administration, 1940.) Pp. iii+19.

Phelps, D. M. (ed.). *Economic Relations with Latin America: Proceedings of a Conference Held as a Part of the Institute of Latin American Studies, Ann Arbor, August 11–12, 1939.* "Michigan Business Papers," No. 6. (Ann Arbor: Bureau of Business Research, School of Business Administration, University of Michigan, 1940.) Pp. 75.

Plumptre, A. F. W. *Central Banking in the British Dominions.* (Toronto: University of Toronto Press, 1940.) Pp. xv+462.

Prather, Charles L. *Money and Banking.* (Rev. ed.) (Chicago: Richard D. Irwin, Inc., 1940.) Pp. xvi+903.

Roberts, George B. (ed. [for the School of Business of Columbia University]). *A Forum on Finance.* (New York: Columbia University Press, 1940.) Pp. x+233.

Robertson, D. H. *Essays in Monetary Theory.* (London: P. S. King & Son, Ltd., 1940.) Pp. ix+234.

Rochester, Anna. *Why Farmers Are Poor: The Agricultural Crisis in the United States.* (New York: International Publishers Co., Inc., 1940.) Pp. 317.

Rodkey, Robert G. (ed.). *Bank Investments and Reserves: Proceedings of the Second Annual Michigan Bankers Association Study Conference, Ann Arbor, December 6 and 7, 1939.* "Michigan Business Papers," No. 8. (Ann Arbor: Bureau of Business Research, School of Business Administration, University of Michigan, 1940.) Pp. v+84.

Rukeyser, Merryle Stanley. *Financial Security in a Changing World.* (New York: Greenberg, Publisher, Inc., 1940.) Pp. 272.

Shannon, Fred Albert. *America's Economic Growth.* (A revision of *Economic History of the People of the United States.*) (New York: Macmillan Co., 1940.) Pp. viii+867.

Singer, H. W. *Unemployment and the Unemployed.* (London: P. S. King & Son, Ltd., 1940.) Pp. x+152.

Social Science Research Council, Committee on Social Security. *Methods of Clearance between Unemployment Compensation and Relief Agencies.* By Arthur T. Jacobs. Pp. viii+52. *Additional Workers and the Volume of*

Unemployment in the Depression. By W. S. Woytinsky. Pp. vii+37. (Washington, 1940.)

Spahr, Walter E. (ed.). *Economic Principles and Problems.* (4th ed.) Vols. I and II. (New York: Farrar & Rinehart, Inc., 1940.) Pp.: I, xix+572; II, xviii+660.

Stone, Harold A.; Price, Don K.; Stone, Kathryn H. *City Manager Government in the United States: A Review after Twenty-five Years,* Vol. VII; *City Manager Government in Nine Cities,* Vol. VIII. (Chicago: Public Administration Service [for the Committee on Public Administration of the Social Science Research Council], 1940.) Pp.: VII, xv+279; VIII, vi+544.

Tax Policy League, Inc. *Property Taxes, A Symposium Conducted by the Tax Policy League, December 27–29, 1939, in Philadelphia, Pennsylvania.* (New York, 1940.) Pp. vi+288.

Tax Policy League, Inc. *Tax Yields, 1939.* (New York, 1940.) Pp. xi+126.

Vinci, Felice. *Analisi economiche.* (1st ser.) (Bologna: Nicola Zanichelli Editore, 1940.) Pp. 463.

Whittaker, Edmund. *A History of Economic Ideas.* (New York: Longmans, Green & Co., 1940.) Pp. xii+766.

Work Projects Administration, Division of Research. *Rural Regions of the United States.* By A. R. Mangus. (Washington: United States Government Printing Office, 1940.) Pp. ix+230.

Work Projects Administration, National Research Project. *Employment and Unemployment in a Depressed Labor Market: Brazil, Ind.* By Miriam E. West, Edward J. Fitzgerald, and George L. Bird. Pp. xv+139. *Mechanization in the Lumber Industry.* By Alfred J. Van Tassel with the assistance of David W. Bluestone. Pp. xx+201. *Trade-Union Policy and Technological Change.* By Harry Ober. Pp. ix+129. *Unemployment and Technological Change.* By Corrington Gill. Pp. 21. (Philadelphia, 1940.)

Work Projects Administration, National Research Project. *Farm-City Migration and Industry's Labor Reserve.* By Francis M. Vreeland and Edward J. Fitzgerald. (Philadelphia, 1939.) Pp. xii+67.

Work Projects Administration, National Research Project in co-operation with Department of the Interior, Bureau of Mines. *Mechanization, Employment, and Output per Man in Bituminous-Coal Mining,* Vols. I and II. By Willard E. Hotchkiss, F. G. Tryon, Charlotte K. Warner, L. N. Plein, Walter M. Dake, R. L. Anderson, J. J. Gallagher, and Margaret H. Schoenfeld. (Philadelphia, 1939.) Pp. xxx+436.

Work Projects Administration, National Research Project, in co-operation with Department of the Interior, Bureau of Mines. *Technology, Employment, and Output per Man in Copper Mining.* By Y. S. Leong, Emil Erdreich, J. C. Burritt, O. E. Kiessling, C. E. Nighman, and George C. Heikes. (Philadelphia, 1940.) Pp. xvi+260.

Work Projects Administration, sponsored by the Securities and Exchange Commission. *Survey of American Listed Corporations.* Vols. I, II, and III. (New York, 1940.) Pp.: I, 291; II, 375; III, 280.

Works Progress Administration, Division of Research. *Youth in Agricultural Villages.* By Bruce L. Melvin and Elna N. Smith. (Washington: U.S. Government Printing Office, 1940.) Pp. xxi+143.

Young, James T. *The New American Government and Its Work.* (4th ed.) (New York: Macmillan Co., 1940.) Pp. xviii+1118.

5